

NeuroPsychoEconomics Conference



10TH NEURO PSYCHO ECONOMICS CONFERENCE



MAY 29-30, 2014

CONFERENCE CHAIRS:



ERNST
POEPPEL



KAI FEHSE

NEUROSCIENCE OF COGNITION,
COMMUNICATION, ECONOMIC DECISION
MAKING, AND MARKETING:
INNOVATION THROUGH COLLABORATION



LUDWIG MAXIMILIAN
UNIVERSITY
MUNICH,
GERMANY



2014 NeuroPsychoEconomics Conference Proceedings

<http://www.neuropsychoeconomics.org>

ISSN 1861-8243

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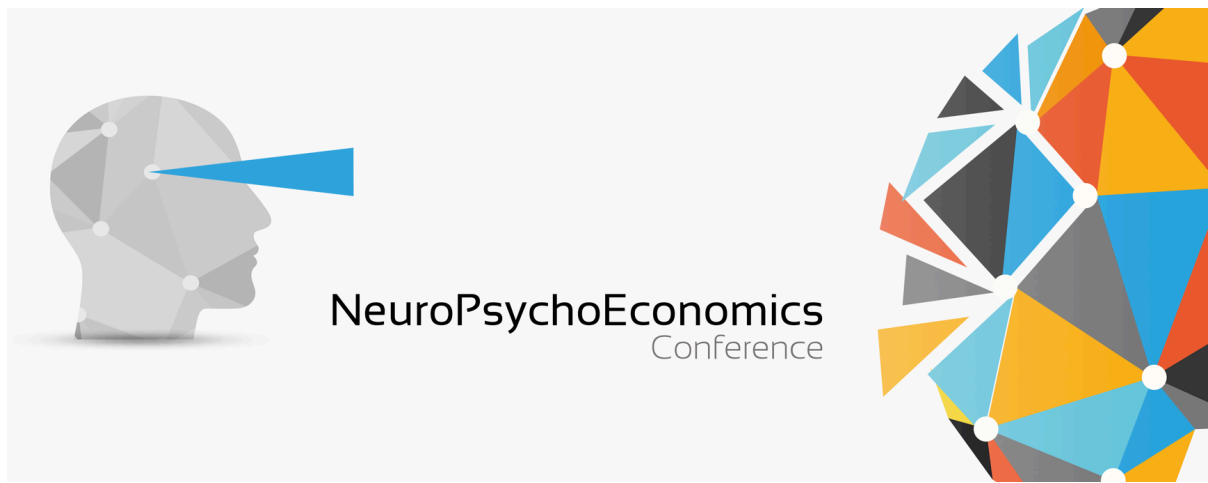
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2014 NeuroPsychoEconomics Conference Program

Conference Theme:

“Neuroscience of Cognition, Communication, Economic Decision Making, and Marketing: Innovation through Collaboration”

LUDWIG MAXIMILIAN UNIVERSITY—HUMAN SCIENCE CENTER

(Pettenkoferstrasse 14, D-80336 Munich, Germany, www.en.hwz.uni-muenchen.de)

The conference language is English.

May 29, 2014

03:00-06:30 PM:

Pre-conference activity (*included in conference fee*)

Theme: A neuroaesthetic glance at ten famous paintings
Guide: Ernst Pöppel
Location: Tour starts at the main entrance of the Alte Pinakothek

For more information about this social event, please see page 12.

06:30-07:30 PM:

Registration
 Location: Mosaiksaal (Human Science Center)

06:30-07:15 PM:

Annual board meeting—by invitation only

- *JNPE* Editors: Daniel Houser and Bernd Weber
- *JNPE* and *ANPE* Editorial Board Members
- *ANPE* Presidents: Ernst Pöppel and Kai Fehse
- *ANPE* Executive Directors: Martin Reimann and Oliver Schilke

Location: H U1.15 (in the basement of the Human Science Center building at Goethestrasse 31)

07:00-09:30 PM:

Neuro Beer
 Location: Mosaiksaal & Garden “Am Fischbrunnen”

Enjoy famous Augustiner beer, brewed according to the “Bayerisches Reinheitsgebot,” and a Bavarian “Bratwürstl” barbecue (*included in conference fee*).

09:30 PM-open end:

Dance and cheer to some of the best R&B, Hip Hop and House tracks of the last 30 years
 Location: Mosaiksaal and below

May 30, 2014

08:00-08:30 AM: Registration continues
Location: Mosaiksaal

08:30-08:45 AM: Welcome note
Kai Fehse, Conference Chair
Location: Hörsaal F108

08:45-09:45 AM: Keynote speech
Antoine Bechara, University of Southern California
“Decision neuroscience: how it started and where we are today”
Location: Hörsaal F108

09:45-10:15 AM: Poster session I & coffee break
Location: Mosaiksaal

10:15-12:15 AM:

Session I

Track: Advertising & food choice
Track chair: Bernd Weber, University of Bonn
Location: Hörsaal F108

10:15 AM: *Bertin, Yasumatsu, Tanida*
A Bayesian model for integration of self-report and biometric data

10:35 AM: *Droulers, Adil*
Perceived gaze direction modulates ads memorization

10:55 AM: *Lacoste-Badie, Droulers*
Advertising memory: the power of mirror neurons

11:15 AM: *Langen*
The relevance of fair trade certification in consumers' coffee choice

11:35 AM: *Reimann, MacInnis, Bechara*
Reward commensurability: behavioral, neurophysiological, and psychological evidence

11:55 AM: *Weber, Hampel, Pogoda, Mormann*
Using multivariate pattern analyses to predict within- and across-category preferences in food choice

Track: Learning & behavioral economics
Track chair: Carsten Herrmann-Pillath, Frankfurt School of Finance & Management
Location: Hörsaal F104

10:15 AM: *Hytönen, Nikander, Halko*
Do people break even or learn from experience?

10:35 AM: *Chen, Du*
Heterogeneity in experienced-weighted attraction learning and its relation to cognitive ability

10:55 AM: *Nye, Kochergina, Orel, Yudkevich*
The role of biology in determining human achievement: 2D:4D and the effect of prenatal testosterone on wages

11:15 AM: *Pauwels, Declerck, Boone*
Power, social values and their role in directing 'the orchestra of heuristics' in social dilemmas

11:35 AM: *Dilmaghani*
Cardinal utility of religiosity: between economics and psychology

11:55 AM: *Herrmann-Pillath*
Towards a conceptual framework for the neuroeconomic analysis of institutions: the case of money

12:15-01:00 PM: Awards luncheon (*included in conference fee*)
Location: Mosaiksaal

01:00-03:00 PM:

Session II

Track: Economic decision-making
Track chair: Theresa Treffers, Eindhoven University of Technology
Location: Hörsaal F108

- 01:00 PM: *Aydogan, Furtner, Kern, Jobst, Müller, Kocher*
Oxytocin increases altruistic punishment among humans
- 01:20 PM: *Chen, Lin*
Don't get mad, get even: emotions in ultimatum games
- 01:40 PM: *Lambert, Emonds, Declerck, Boone*
The influence of social value orientation and trust on the processing of negative reciprocity: an fMRI study
- 02:00 PM: *Brandstätter, Körner*
Attention in risky choice
- 02:20 PM: *Achtziger, Alós-Ferrer, Hügelschäfer, Steinhauser*
Higher incentives can impair performance: neural evidence on reinforcement and rationality
- 02:40 PM: *Treffers, Gutyrchik, Fehse*
Be happy, but always remember: the neural correlates of affect and overconfidence

Track: Neuromarketing
Track chair: Martin Reimann, University of Arizona
Location: Hörsaal F104

- 01:00 PM: *Schubert, Weber, Raab, Trautner, Bartling*
Neural basis of the influence of payment systems (cash vs. debit card payment) on purchase behavior: an experimental neuroeconomic study
- 01:20 PM: *Brandstaetter, Perktold, Foscht, Bauernhofer*
Neurological bases of selling and customer orientation: an exploratory study
- 01:40 PM: *Aubert, Dubernat*
Physiologically constrained matching between brain and stimuli - implications for economic decision-making and marketing
- 02:00 PM: *Heinonen*
Companied conjoint analysis and fMRI technique
- 02:20 PM: *Guido, Prete, Piper, Mileti*
Distortion in consumers' money perception: a study on values and quantity
- 02:40 PM: *Almiron-Chamadoira*
Neuromarketers' profile: a study of consumer neuroscience professionals' backgrounds

03:00-03:30 PM: Poster session II & coffee break
Location: Mosaiksaal

03:30-04:15 PM: Practitioners' panel
Discussant: Bernd Werner, Gruppe Nymphenburg Consult AG
"Neuromarketing: insights from recent applications of neuroscience to marketing"
Location: Hörsaal F108

04:15-05:15 PM:

Anniversary session

Track: *JNPE classics: JNPE's best paper award winners*
Track chair: **Oliver Schilke, University of California, Los Angeles**
Location: **Hörsaal F108**

- 04:15 PM: *Steffen, Rockstroh, Jansma*
Brain evoked potentials reflect how emotional faces influence our decision making
(*JNPE*, Vol 2(1), May 2009, 32-40)
- 04:30 PM: *Hodgson, Guala, Miller, Summers*
Limbic and prefrontal activity during conformity and violation of norms in a coordination game.
(*JNPE*, Vol 5(1), Feb 2012, 1-17)
- 04:45 PM: *Riedl, Javor*
The biology of trust: integrating evidence from genetics, endocrinology, and functional brain imaging
(*JNPE*, Vol 5(2), May 2012, 63-91)
- 05:00 PM: *Ravaja, Somervuori, Salminen*
Predicting purchase decision: the role of hemispheric asymmetry over the frontal cortex
(*JNPE*, Vol 6(1), Mar 2013, 1-13)

05:15-05:45 PM:

NeuroPsychoEconomics 10-year anniversary speech
Ernst Pöppel, Ludwig Maximilian University
“How to escape the jungle of time”
Location: Hörsaal F108

05:45 PM:

Good bye note & adjourn
Ernst Pöppel, Conference Chair
Location: Hörsaal F108


2014 NeuroPsychoEconomics Poster Sessions

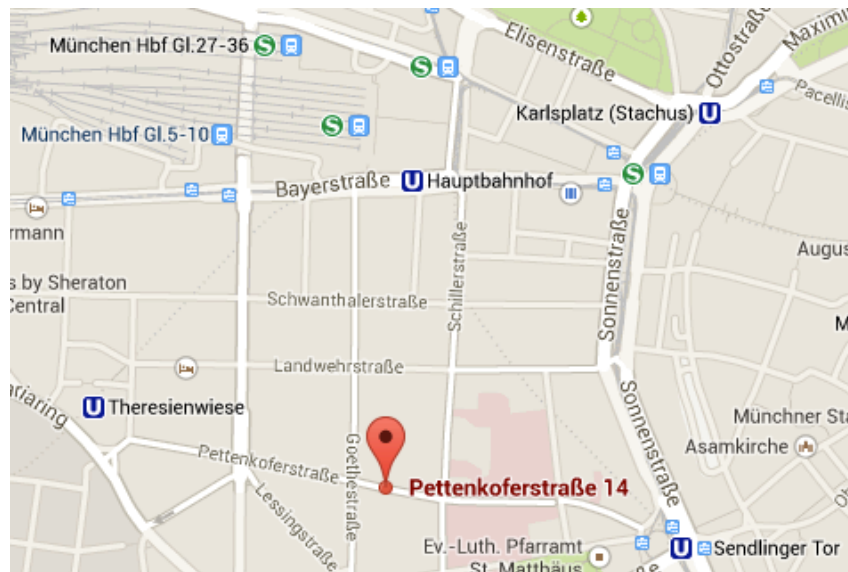
Poster sessions will take place from 09:45 to 10:15 AM and from 03:00 to 03:30 PM in the Mosaiksaal.

Poster session presenters must hang their poster by 08:30 AM on May 30, 2014 at designated spaces at the conference venue and take them off at the end of the second poster session (i.e., 03:30 PM). We strongly recommend that presenters are present during both sessions.

- P01** *Bagdziunaite, Jensen, Auning-Hansen, Clement, Zoëga Ramsøy*
What counts most? How price, country of origin and nationality dynamically affect consumer preference
- P02** *Bosshard, Bourke, Koller, Meier, Walla*
Like it or not: physiological correlates of brand attitudes
- P03** *Ceccato, Kudielka, Schwieren*
Chronic stress promotes risk loving behavior in young adults
- P04** *Chernyak, Goodyear, Krueger*
Neural signatures of interpersonal trust: a coordinate-based meta-analysis
- P05** *Chopra, Mathur, Paul*
Effect of meditation on consciousness and human health as assessed by psycho-immune correlates
- P06** *da Rocha Lima Filho, Rocha, Massad*
Neuroeconomic studies from an investment environment simulation
- P07** *Hügelschäfer, Alós-Ferrer*
Neural evidence on the role of conflict monitoring in choice-induced preference change
- P08** *Koch, Ramsøy, Nyström*
The household planning game – assessing everyday risk taking with a novel gambling task using eyetracking to measure the effect of visual attention during trials
- P09** *Niaz, Jacobsen, Zeller, Lins, Ramsøy*
Happy and in charge: how moods affect the illusion of control
- P10** *Raab, Paul, Weichenmeier*
The effectiveness of neurofeedback (HEG) to reduce impulsive buying behaviour
- P11** *Sellitto, Ciaramelli, di Pellegrino*
The relationship between moral judgment and intertemporal choice
- P12** *Vizitiu, Văleanu, Tantău, Tanțău, Vasiliu, Marin, Nistorescu*
Decision making diagnosis within aero-space sector
- P13** *Wisniewski, Chlupsa*
Implicit communication in brand management as a critical success factor

Conference Venue

LUDWIG MAXIMILIAN UNIVERSITY—HUMAN SCIENCE CENTER 
(Pettenkoferstrasse 14, D-80336 Munich, Germany, www.en.hwz.uni-muenchen.de)



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How to get here

- :: By train: Walk from Munich Main Station (München Hauptbahnhof) in ~5 min
- :: By air & taxi: Take a taxi from Munich International Airport (MUC) for about €60 (~40 min)
- :: By air & train: Take S1 or S8 from Munich International Airport (MUC) to Munich Main Station (München Hauptbahnhof) for €10 (~45 min)

Optional Museum Tour on Thursday, May 29

Please note:

- :: Meeting point: entrance of the Alte Pinakothek.
- :: Please be on time (3pm sharp), the group cannot wait for you.
- :: The guided tour will take approximately 30 minutes. Afterwards, you can explore the Alte Pinakothek on your own and/or visit the other museums of the famous Kunstareal.
- :: Museum admission is included in the conference fee.



© by Pinakotheken

Alte Pinakothek, Barer Strasse 27, D-80333 Munich, Germany

How to get here

- :: By tram: Take tram No. 27 to Pinakotheken
- :: By underground: Take U2 to Königsplatz or Theresienstrasse or U3, U4, U5, or U6 to Odeonsplatz
- :: By bus: Take bus No. 100 (Museumslinie/museum line) to Pinakotheken

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A Bayesian model for integration of self-report and biometric data

Mathieu Bertin¹, Ken Yasumatsu, Yasuo Tanida

Abstract

Self-report and biometric methods both give important and complementary insight on the influence of a marketing stimulus. We use Bayesian inference to integrate information from survey and EEG recordings during the pre-testing of television commercials. Subjects were presented with a set of commercial videos. Their brain activity was monitored through EEG during presentation of the ads. After each commercial, they were requested to report in a survey which emotions the video had evoked them. By integrating survey and EEG data through Bayesian modeling, we inferred for each second of each ad the posterior distribution of the reported emotions. Combination of the different data leads to a deeper insight on the actual mental processes involved in the reception of a marketing message.

¹ Corresponding author: Mathieu Bertin - Synergy Marketing, Inc., E-Mail: mathieu.bertin@synergy101.jp.

Perceived gaze direction modulates ads memorization

Olivier Droulers², Safaa Adil

Abstract

Gaze has important functions in human social interactions. A direct gaze can be used to focus observer's attention on a face, while an averted gaze can be used to direct observer's attention to an object or a point in space. Several studies in neuroscience and psychology demonstrate the role of gaze direction not only in orienting observer's attention but also in modulating his cognitive process. Perceived gaze direction (direct gaze or averted gaze) influences cognitive functioning as it encourages observers to focus attention on the gaze itself, increasing face memorization. Nevertheless, direct gaze may also cause adverse cognitive consequences, like impaired peripheral target detection for example. In marketing, little is known about gaze direction effect on consumer attention toward ads and ad processing. This research presents recent findings on the psychological and neural mechanisms of gaze direction processing. Then, using a folder test procedure, it investigates the influence of perceived gaze direction of a character's in a print ad on product and brand memorization. Comparing two conditions – ads presenting a face with “a gaze toward the product” or “a gaze toward the observer” – our results show that ads with a gaze toward the product increases product and brand memorization. As these results were obtained by reproducing a natural context – a folder magazine – we believe that they are of particular interest for managers, especially in the light of the more and more crowded advertising environment marketers have to face nowadays. Further research is needed to explore other effects of gaze direction, such as for example the effects on advertising evaluation.

² Corresponding author: Olivier Droulers - Center for Research in Economics and Management, University of Rennes 1, E-Mail: olivier.droulers@univ-rennes1.fr.

Advertising memory: the power of mirror neurons

Sophie Lacoste-Badie³, Olivier Droulers

Abstract

As part of the insights of neuroscience available for the study of advertising, the concept of mirror neurons provides opportunities for new research. Mirror neurons are a particular class of visuomotor neurons in the brain that show activity both when an individual performs an action and when he observes another individual performing the same action. According to researchers in cognitive neuroscience, mirror neurons are the brain basis for learning by imitation. The observation of two types of movement specifically causes the mirror neurons activation: "grasping with the hand" and "bringing to the mouth". This paper seeks to show that television commercials, in which a character grabs a food product and brings it to his mouth, are more effective. To investigate this research question we designed a between-subjects experiment (n = 130) to compare the memorization of two versions of the same ad (featuring an unfamiliar mineral water brand). In the first ad version, the character grabs the product, while there is no contact between the product and the character in the second version. The paper outlines that memory was higher in the grasping and drinking condition. Although we cannot conclusively say that the mirror neurons were activated when people saw the character grabbing the product in the ad, the literature on mirror neurons provides an explanatory framework for the observed results. In other words, this study points out that the discovery of mirror neurons is a very new concept for marketing, which can enrich our understanding of advertising processing.

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The relevance of fair trade certification in consumers' coffee choice

Nina Langen⁴

Abstract

The presentation discusses the results of three consumer studies assessing the importance of fair trade certification for consumers' coffee choice. The first study focuses on consumers' preferences and willingness to pay for different ethical coffee attributes such as fair trade certification, organic production and monetary support of small farmers. A hypothetical choice experiment has been used to investigate trade-offs consumers make between different ethical product characteristics. In the second study the range of possibly relevant coffee characteristics has been expanded and ethical aspects related to the production were presented among other non-production linked attributes such as brand. In the experiment participants were invited to select one coffee out of three presented in form of an information display matrix. At the beginning of the experiment respondents had no precise information about the different coffees available. The coffee characteristics were hidden and consumers could get an idea of the coffee attributes only after actively searching for the different attribute levels of the coffee attributes. The third study tested consumers' preferences for Fair Trade coffee in a natural field experiment in which the coffee purchase situation was presented in an authentic way thereby participants did not realize that they took part in an experiment. Within the Night of Sciences of the University of Bonn a professional barista and his team offered coffee at the lobby of the main university building. Visitors had the choice between three different coffee drinks: normal coffee, latte macchiato and espresso. Each of these drinks was available in conventional, non certified, quality and in Fair Trade quality. The findings provide valuable insights into consumers' preferences for fair trade production. Results help to understand the current situation of Fair Trade in Germany.

⁴ Corresponding author: Nina Langen - Institute for Food and Resource Economics, Department of Agricultural and Food Market Research, University of Bonn, E-Mail: nina.langen@ilr.uni-bonn.de.

Reward commensurability: behavioral, neurophysiological, and psychological evidence

Martin Reimann⁵, Deborah MacInnis, Antoine Bechara

Abstract

Recent research has examined whether different rewards (e.g., food, money) are tied to a common brain system (i.e., the striatum) such that they are viewed as commensurable (i.e., measurable by the same standard and hence substitutable). The present research takes the novel approach of asking whether rewards that are merely possible (versus certain to be obtained) can be viewed as commensurable with, and hence substitutable for, rewards that are certain. In the context of food choice, this research reveals that merely possible rewards are indeed commensurable with certain rewards and, in fact, can motivate consumers more than certain rewards. Specifically, two experiments demonstrate that (1) consumers are willing to partially substitute a certain food reward for a merely possible reward (e.g., a possible monetary lottery win, the possible acquisition of frequent flyer miles), (2) merely possible rewards and certain rewards activate a common area of the brain, particularly, the dorsal striatum, (3) merely possible rewards induce a greater state of motivational wanting than do certain rewards, and (4) motivational wanting mediates the commensurability effect on choice.

⁵ Corresponding author: Martin Reimann - Department of Marketing, Eller College of Management, University of Arizona, E-Mail: reimann@arizona.edu.

Using multivariate pattern analyses to predict within- and across-category preferences in food choice

Bernd Weber⁶, Matthias Hampel, Luca Pogoda, Florian Mormann

Abstract

Up to now, the specific contribution of different brain regions to the computation of product preferences remains unclear. Previous decoding studies focused mostly on a single region of interest for predicting preference ranks across a single product category. Thereby, the ventromedial prefrontal cortex constituted a reliable source for preference decoding. But it remained questionable whether other areas, are predictive as well. The aim of our study was to close this gap by determining all areas responsible for coding product preference signals. We used different categories to exclude activations which are specific for one category only. Subjects performed two computer based binary-choice tests between all twenty items of chocolate bars and salty snacks, respectively. From the resulting preference rankings, the five favorite and the five least preferred products were chosen as stimuli for the fMRI experiment. In the MRI-scanner each product was presented and subjects had to rate it on a scale from one to four. Multivoxel-pattern analysis was performed on the whole brain by a searchlight approach. Resulting searchlight maps were compared to localize brain regions with common activation pattern for both product categories. Group analysis of searchlight maps was done for each category separately. But only voxels with significant accuracy values ($p < .05$, FDR) for both categories were taken into account. Thereby, the dorsal anterior cingulate cortex (dACC), the medial prefrontal cortex (mPFC) and the thalamus could be revealed as areas for general coding of preferences. The exact computations between these regions need to be investigated further.

⁶ Corresponding author: Bernd Weber - Life&Brain Center, University of Bonn, E-Mail: bweber@lifeandbrain.com.

Do people break even or learn from experience?

Kaisa Hytönen⁷, Jan Nikander, Marja-Liisa Halko

Abstract

Path-dependence in choice behavior is a persistent phenomenon. Gamblers and traders take higher risk bets to break even after experiencing losses, and investors show a tendency of holding on to losers too long and selling the winners too early. In contrast, the reinforcement learning theories predict that decision makers learn to avoid the high risk options from which they have previously received negative outcomes. Here we examine which tendency is stronger: the need to break even or learning from prior loss experiences. In the fMRI scanner, we presented our subjects sequences of choice situations where they selected between a low risk gamble and a high risk gamble, and the outcome of the selected gamble was added to their total earnings. The lotteries were designed so that the decision makers can recover a loss from the high risk gamble only by reselecting the high risk gamble. Behaviorally we found that subjects reselected the high risk gamble significantly more often after a loss experience than after a gain experience, supporting the break-even tendency, while the pattern was opposite, but non-significant, for the low risk gambles. To study the role of the striatum in valuation and learning we identified from the brain data the parts of the ventral striatum which were sensitive to positive outcome valence. We found a larger difference in signal values (gain > loss) in the high risk than low risk gambles, suggesting either larger valuation difference or stronger prediction error signals for high risk than low risk gambles. Taken together, the brain data is compatible with the valuation account but not with the learning account due to the lack of learning from experience in the high risk gambles.

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Heterogeneity in experienced-weighted attraction learning and its relation to cognitive ability

Shu-Heng Chen⁸, Ye-Rong Du

Abstract

In this article, we apply the experience-weighted attraction (EWA) learning model to examine the learning behavior of a set of 108 subjects, who participated in one of the six series of 15- to 20-person Keynes' beauty contest experiments, held at National Chengchi University in year 2010. Our earlier study (1 citation removed for masked review) has found a positive relation between cognitive ability, measured by a working memory test, and cognitive hierarchy, in the sense of level-k reasoning. Through the analysis of the estimated Markov transition matrix, we further found that the subjects with a higher cognitive ability have a different dynamic behavioral pattern from those with a lower cognitive ability, which indicates the possible effect of cognitive ability on learning. Hence, as a subsequent study, we examine this possibility by directly applying the EWA learning model, which was first applied to the beauty contest experiment data by Camerer and Ho (1999). We consider two different action spaces in terms of granulation: one which has a finer division Camerer and Ho (1999) and hence a large number of choices, and one which has a rather coarse division directly corresponding to the Nagel's classification of reasoning levels (Nagel, 1995). We found that the high cognitive able subjects differ from the low cognitive subjects in the estimated parameters of the EWA models, when one uses the coarse division. Among the five parameters of the model, we are particularly interested in the one which is normally understood as the capability to do counterfactual reasoning or imagination (the parameter δ). We found that δ of the more cognitive able subjects is significantly larger than that of the less cognitive able subjects (0.588 vs. 0.489), and if we further restrict the sample to the tailed 25% subjects, δ is even low to 0.277. However, this relation between cognitive ability and δ disappears when the EWA model is applied to version with finer division. This result may lead to a fundamental question concerning the applicability of (generalized) reinforcement learning to the situation when a large number of many possible choices are presented.

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The role of biology in determining human achievement:

2D:4D and the effect of prenatal testosterone on wages

John V. C. Nye, Ekaterina Kochergina⁹, Ekaterina Orel, Maria Yudkevich

Abstract

There is now a large literature on the correlates of prenatal androgen exposure and various individual measures of performance in sports, business, or schooling. However, still there is a relatively limited evidence on the impact of prenatal androgens on life achievement. Using data from the Russian longitudinal survey and measured digit ratios, we found that age-corrected market wages are correlated with low measured 2D:4D ratios signifying higher prenatal testosterone. Unlike earlier work on non-cognitive correlates of labor market wages, our findings indicate a clear-cut optimum 2D:4D ratio for women's wages with higher and lower 2D:4D being associated with lowered wages.

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Power, social values and their role in directing 'the orchestra of heuristics' in social dilemmas

Loren Pauwels¹⁰, Carolyn H. Declerck, Christophe Boone

Abstract

Decisions in social dilemmas are often complex and uncertain, since cooperation can potentially be costly to the actor. Nonetheless, behavioral data show that prosocial acts of this kind are ubiquitous even in anonymous, one-shot interactions. Insights into how the brain works can shed new light on such seemingly 'irrational' behavior. So far, several theories propose that we use simple heuristics as shortcuts to deal with complex (social) problems and decisions. Much of this research has primarily focused on the universal aspects of such shortcuts: heuristics can be thought of as making us smart, stupid, or plainly cooperative. However, it remains unclear how different types of heuristics are orchestrated and how they can account for individual differences in cooperative strategies. Previous research on the determinants of cooperation points out that the decision to cooperate comes about through a complex interplay of intrinsic motivation, extrinsic cues and relational cues. In this article, we draw on insights from different streams of research to propose an integrative framework that relates heuristic processing of social cues to individual differences in the psychological experience of power and social value orientation (SVO). In this framework we propose that power is a moderator of cooperative behavior by guiding two different types of heuristic processing: intrinsic default processing, which is determined by SVO, and cue-induced processing, triggered by extrinsic cues. The framework furthermore suggests that power does not corrupt: the powerful are mostly guided by their intrinsic social values, while the powerless will engage more in cue-induced processing. An additional postulate is that cue-induced processing may lead to different outcomes depending on social values. We substantiate these propositions with existing literature in psychology, behavioral economics, and neuroscience. Finally, we present new behavioral data to illustrate how experiencing different forms of power and SVO affect trust- and reciprocity decisions.

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Cardinal utility of religiosity: between economics and psychology

Maryam Dilmaghani¹¹

Abstract

Using the latest wave of Canadian Ethnic Diversity Survey, I estimate the impact of religiosity on the self-reported level of subjective wellbeing, controlling for a wide range of socio-economic, demographic and psychological factors. As such, the estimated model is build upon multidisciplinary insights. I find that religiosity relates to life-satisfaction through a statistically significant, positive coefficient. Incorporating interaction terms into the model, I find that religiosity enhances the partial effect of most psychological and demographic variables but it is insignificant for the array of socioeconomic explanatory variables. Constructing a multidimensional religiosity index, I also account for cross-denomination differences in the impact of religiosity on subjective wellbeing. Through this set of estimations, I find that Catholics' coefficient is positive and statistically significantly larger than the coefficient of all other groups while Jewish denominations score the lowest through a negative coefficient. Various explanations, including the interaction between ethnicity and religious denomination are examined.

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Towards a conceptual framework for the neuroeconomic analysis of institutions: the case of money

Carsten Herrmann-Pillath¹²

Abstract

The paper develops a conceptual framework for the neuroeconomic analysis of money that is based on recent theories of grounded and distributed cognition. In doing this, I show that a unique historical contribution to the theory of money, Simmel's 'Philosophy of Money', receives full support by recent research in psychology and neuroscience. I take this issue as a litmus test that allows for a methodological evaluation of the recent Glimcher/Camerer controversy over the appropriate frames for neuroeconomics (neoclassical vs. behavioural), levels of analysis (basic reward circuits vs. higher-level concept/model based learning) and units of analysis (mechanisms versus emotions). I propose that the artefact of money activates emotions that regulate social reciprocity, thus triggering distinct neuronal activity patterns that have been identified experimentally in the context of money illusion and the related behaviour. This shows how neuroeconomics can help to explain the peculiar functioning of human institutions without succumbing to neuronal reductionism.

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Oxytocin increases altruistic punishment among humans

Gökhan Aydogan¹³, Nadja Furtner, Bianca Kern, Andrea Jobst, Norbert Müller, Martin Kocher

Abstract

Social behavior has repeatedly been shown to be influenced and modulated by biological factors, such as neuropeptides and hormones, as well as by social norms and socialization. There is, however, still scarce evidence regarding the link between these two factors and the effect of hormones on social norms. In this paper, we investigate the influence of exogenous application of oxytocin on the enforcement of social norms and cooperation in a social dilemma situation. Although the hormone oxytocin is well known for promoting certain pro-social behaviour, such as trust or affiliation, it has also been shown to increase defensive behaviour towards outgroup members and maternal aggression in humans and non-human mammals, respectively. Since the enforcement of social norms requires both a pro-social attitude and the willingness to actively sanction norm violating behaviour, we hypothesize that oxytocin modulates cooperation via norm enforcement. (1) We find the neuropeptide oxytocin to substantially increase both the inclination and the magnitude of punishment against free-riding, even though the act of punishment yields no future material gain and is costly for the punisher. (2) Moreover, we find that oxytocin increases the inclination to cooperate in a social dilemma when a punishment option is available, but to have no effect on cooperation in the absence of sanctioning mechanisms. Hence, oxytocin seems to operate not by increasing the intrinsic motivation to cooperate per se, but rather by enhancing the level of trust in the deterring effect of a sanctioning mechanism. Thus, subjects are more willing to deter defective behavior under the influence of oxytocin. And additionally, they seem to believe that others perceive the sanctioning mechanism as a credible threat. Consequently, our results suggest that the effect of oxytocin on the willingness to deter norm violations of selfish individuals might promote cooperation and thus make up part of the wide established effect of oxytocin on social cohesion.

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Don't get mad, get even: emotions in ultimatum games

Shu-Heng Chen¹⁴, Chia-Yang Lin

Abstract

Based on the idea of emotional embeddedness, this paper studies the possible influence of emotions on decision in the ultimatum game. Given the two possible emotion-cueing environments, we propose two emotion indexes, called the nay-based emotion and the reference-based emotion, as measures of the possible emotion state of the subjects in the game. We characterize subjects' behavior as a stochastic choice model with the assumption that their decisions (the offer rate made by the proposed, in our case) can be affected by the triggered emotions. This assumption is then examined using an ordered logit model under different settings of subjects' characteristics. Our estimation based on the Monte Carlo simulation then shows the effects of both kinds of emotions, and that effect can differ by gender and by the employed exchange medium (money or chocolate, in our case).

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The influence of social value orientation and trust on the processing of negative reciprocity: an fMRI study

Bruno Lambert¹⁵, Griet Emonds, Carolyn H. Declerck, Christophe Boone

Abstract

The principle of reciprocity is a universal social norm and arguably among the most important determinants of mutually cooperative human relationships. Violating this norm causes strong negative emotions and punitive sentiments, and may shape one's future expectations of cooperation. To gain understanding in how social interactions are appraised this study investigates the neural processes that are elicited when the reciprocity norm is honored or breached. People vary in their willingness to comply to social norms, and this is likely to be reflected in how they appraise breaches of reciprocity. Traits that facilitate cooperative behaviors, such as a prosocial value orientation and high dispositional trust, can be regarded as "commitment devices" that assure positive outcomes, but that operate on principles of behavioral assimilation: breaches of trust or norm violations are met with anger and lead to negative reciprocity (Frank, 1988). Therefore, the purpose of the current study is to test if processing negative reciprocity varies with individual differences in social value orientations (SVO) and generalized trust. We set up an fMRI experiment (N = 38) which allowed us to compare how different individuals initiate cooperation in a series of one-shot, anonymous sequential prisoner's dilemma games, played with different presumed partners. We furthermore measure the neural activation patterns when feedback is appraised. The behavioral results indicate that trust and SVO interact significantly with trial number: during early trials prosocials cooperate significantly more than proselfs, conform to their internalized cooperative norm. During later trials in the experiment the effect of SVO disappears, and trust becomes the most important determinant of behavior. Preliminary whole-brain analyses of the fMRI data indicate a difference in brain activation between positive and negative reciprocity. While positive reciprocity is associated with clusters of activation in the valuation system of the brain, negative reciprocity activates primarily the posterior cingulate and precuneus. Contrasting negative reciprocity with positive reciprocity in interaction with SVO yields clusters of activation in the anterior cingulate. Data of this kind enlighten us about the different profiles associated with processing negative reciprocity, which is important in order to understand the subsequent steps that may lead to punishing behaviors.

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Attention in risky choice

Eduard Brandstätter¹⁶, Christof Körner

Abstract

Previous research on the processes involved in risky decisions has rarely linked process data to choice directly. We used a simple measure based on the relative amount of attentional deployment to different components (gains/losses and their probabilities) of a risky gamble during the choice process, and we related this measure to the actual choice. In an experiment we recorded the decisions, decision times, and eye movements of 80 participants who made decisions on 11 choice problems. We used the number of eye fixations and fixation transitions to trace the deployment of attention during the choice process. We obtained the following main results. First, not all pieces of information received the same amount of attention, which refutes choice models that rely on weighting and summing of information. Second and most important, different components of a gamble attracted different amounts of attention depending on participants' actual choice. This was reflected in both the number of fixations and the fixation transitions. This result supports dimensional decision strategies such as the priority heuristic. Finally, a comparison of data obtained with eye tracking and verbal protocols showed a large degree of convergence regarding the process of risky choice.

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Higher incentives can impair performance: neural evidence on reinforcement and rationality

Anja Achtziger, Carlos Alós-Ferrer¹⁷, Sabine Hügelschäfer, Marco Steinhauser

Abstract

Standard economic thinking postulates that increased monetary incentives should increase performance. Research in economics and psychology, however, has reported on a number of phenomena which greatly complicate the mapping from incentives to performance, including crowding out of intrinsic motivation (Gneezy & Rustichini, 2000; Ariely et al., 2009), ceiling effects (Camerer & Hogarth, 1999), and choking under pressure (Baumeister, 1984). In this work, we identified an additional mechanism leading to counter-intuitive effects of incentives on performance. Human decision makers frequently focus on past performance, a form of reinforcement learning (Thorndike, 1911; Sutton & Barto, 1998) occasionally at odds with rational decision making. We used an incentivized belief-updating task from economics to investigate this conflict through measurements of neural correlates (EEG) of reward processing. We found that higher incentives fail to improve performance when immediate feedback on decision outcomes is provided. Subsequent analysis of the feedback-related negativity (FRN), an early event-related potential following feedback, revealed the mechanism behind this paradoxical effect. As incentives increase, the win/lose feedback becomes more prominent, leading to an increased reliance on reinforcement and more errors. We explored this phenomenon in two experimental studies. In Study 1, higher incentives failed to increase performance. Instead, higher incentives produced a positive correlation between FRN amplitudes and error rates. Since the FRN is a neural correlate of reinforcement learning (Holroyd & Coles, 2002; Holroyd et al., 2003), this indicates that additional errors were created by an increased reliance on reinforcement processes. In the low-incentive condition, there was no correlation between FRN amplitudes and error rates. A natural explanation is that, while incentives do have a positive effect on performance, this effect is offset by automatic reinforcement learning, leading to the observed relationship between FRN and reinforcement error rates in the high-incentive condition. In Study 2, where the reinforcement process was blocked, the link between incentives and performance was restored. We conclude that increased incentives might induce errors, and the neural mechanism behind this link is a reinforcement learning process. Higher incentives make win/lose feedback more prominent and lead to a higher reliance on faulty reinforcement. This insight is highly relevant for economic decision making and the debate on performance-based pay. Reinforcement processes are linked to extremely early brain responses and are very difficult to control. An excessive increase of performance-based monetary payments in e.g. managerial settings where similar decisions are made frequently in a changing environment (lending and investment, supplier contracts, hiring, personnel allocation) might lead to an increased weight of reinforcement-based decisions (ex-post justified as “managerial gut feeling”) instead of increasing performance. Our research also points out the need for decision-making strategies removing the emotional attachment generated by win/lose outcomes, hence restoring the incentives-performance link.

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Be happy, but always remember: the neural correlates of affect and overconfidence

Theresa Treffers¹⁸, Evgeny Gutyrchik, Kai Fehse

Abstract

Overconfidence is one of the most prevalent cognitive biases that can negatively affect people's judgment and decision quality. We investigate the neural correlates of overconfidence in dependence of neutral and joyful affect in a neuroimaging study (N = 16). Subjects' affect was manipulated by presenting joyful and neutral pictures of the International Affective Picture System (IAPS). To measure overconfidence, we used an incentive-compatible task in which subjects answered general knowledge questions and subsequently made confidence judgments about their own performance. Our study reports two main findings: First, a higher activation in the anterior cingulate cortex when answering knowledge questions in a joyful mood compared to a neutral mood. Second, a lower activation in the hippocampus when making confidence judgments in a joyful mood compared to a neutral mood. Linking our neuronal results to our behavioral measures, we find a negative correlation for activation in the hippocampus with overconfidence and a positive correlation with actual performance. Our results imply that people who engage in retrieving and using prior memories and experiences through the hippocampus when making confidence judgments about their own performance can reduce their overconfidence and increase the quality of their decision outcome. The tendency to use prior memories and experiences from the hippocampus is less likely when people are in a joyful than when they are in a neutral mood.

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Neural basis of the influence of payment systems (cash vs. debit card payment) on purchase behavior

an experimental neuroeconomic study

Anna-Maria Schubert¹⁹, Bernd Weber, Gerhard Raab, Peter Trautner, Marcel Bartling

Abstract

Since the 1980ies, the influence of different payment modalities on buying behavior of consumers in the market place is in the focus of scientific research. Several authors conducted respective studies to examine differences between cash and debit/credit card payments. They detected an increased willingness to pay for products, or to purchase larger quantities (Hirschman 1979; Feinberg 1986; Raab 1998; Prelec & Simester 1998, 2001; Soman, 2001). Nevertheless, these findings lack an exhaustive explanation for this phenomenon, named “credit card premium”, on a behavioral-psychological level. Aside from conditioning explanations, self-regulatory and self-control theories are discussed in terms of a lowered spending-control, reduced spending-perception, and a relation between self-worth and payment modality (Feinberg 1986; Prelec & Loewenstein 1998; Pettit & Sivanathan, 2011; Soman, 2001). Current neuroscientific techniques like functional magneticresonance imaging (fMRI) promise to help understanding the basis of the “credit card premium” (Knutson et al., 2007; Raab et al., 2011). Based on previous results, the present study deals with the neural correlates of the payment modalities’ impact on buying behavior. 33 healthy participants took part in a simulated fMRI shopping trip wherein they were introduced to 30 convenience products in two different runs. About two weeks before the scans, participants received an endowment of 100 € which should be used for paying the products in the fMRI shopping trip. This ensured the internalization of the money into the mental budget of the subjects. Within the experiment, subjects stated their willingness to pay (WTP) for the products using a Becker-DeGroot-Marschak-Auction (Becker et al., 1964) in the two conditions, i.e. either using a debit card or cash, which was realized via a debit-1 card terminal. As hypothesized, we found a modulation of activity in areas known to be involved in valuation and price-processing, like the insular cortex and the striatum.

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Neurological bases of selling and customer orientation: an exploratory study

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Abstract

Although the concepts of customer and selling orientation have received considerable attention in past research, their neurological bases have rarely been addressed. Especially, both concepts have not yet been analyzed within an EEG-setting. Additionally, not all of the Big Five personality traits have been linked to customer and selling orientation in previous studies. Therefore, this research investigates the association between the Big Five personality traits (agreeableness, conscientiousness, openness to experience, extraversion, and neuroticism) and customer and selling orientation, and it examines if individuals with a customer or selling orientation show frontal brain asymmetry. Results revealed that individuals with a high selling orientation exhibit greater relative right frontal activity at rest. Further, the results, e.g., showed that agreeableness is positively related to an individual's customer orientation. These finding suggests that the extent of a person's customer or selling orientation is neurologically influenced.

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Physiologically constrained matching between brain and stimuli -

implications for economic decision-making and marketing

Cécile Aubert²¹, Antoine Dubernat

Abstract

We consider decision-making from the point of view of resource allocation in the brain. To make a decision, an individual must first process the information contained in the various stimuli he is receiving, then make a choice based on this information. We focus on the first task, and examine the efficiency of this processing. If some stimuli are not processed (or are not processed by adequate neural zones), the information they contain may not be used to take a decision. The object of this paper is to offer an economic modeling of the processing of stimuli so as to incorporate the environment in the decision-making process, and to obtain implications for decision-making, decision-making in the presence of mood and mental disorders, and marketing. We make use of theoretical results from economic models of matching (especially school choice problems). The allocation of stimuli to neurons, in a context of limited glucose availability, can be modeled as the allocation of students to schools over which they have a preference. In the school choice problem, an important element is that students cannot submit a complete ranking over schools. Similarly, given the time frame during which stimuli are processed, one may reasonably assume that stimuli cannot ‘apply’ to be considered for processing by all available neural zones. This constraint, together with a relative scarcity of brain resources compared with the number of stimuli to process, leads to inefficiencies. Stimuli of a higher priority may not be processed even when lower-priority stimuli are. Our modeling allows to study when some stimuli are more likely to remain unprocessed – or not processed by the zone that could most efficiently do it. In the matching model, this corresponds to remaining unmatched. The results from matching theory can thus be applied to study the relative efficiency of various mechanisms to allocate stimuli. It is more likely that some stimuli will not be treated when the scarcity of brain resources increases, relative to the amount of stimuli to process at a given point in time. The probability that a stimulus not be processed thus increases with the ‘loudness’ of the environment (understood as the number of various stimuli that the individual faces, be them actually related to hearing or to any other stimulus source). This in turn increases the probability that the decision be sub-optimal. It also implies an apparent randomness in decision-making as an individual may make different choices in the same decision task, if she is in a more or less challenging environment.

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Companied conjoint analysis and fMRI technique

Jarmo Heinonen²²

Abstract

Previous researches, documents and studies have shown that neuromarketing and conjoint analysis have been used in many areas of consumer research, and they provide benefit for further understanding of consumer behaviour. Together these two methods may reveal more information about hidden desires, expectations and restrains from customers' brain. This paper attempts to examine these two research methods together as a companied analysis. More specifically this study utilizes fMRI and conjoint analysis as a tool for analysing consumer's preferences and decision making. This paper provides theoretical background with short history of conjoint analysis and contributions for the audience of consumer research i) how conjoint evaluation models works, ii) different conjoint models, iii) counting attribute interactions in conjoint analysis and iv) brain activation triggers in fMRI and connection to conjoint analysis. Researchers, scholars and practitioners of consumer behaviour may learn new method of understanding user's preferences and decision making.

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Distortion in consumers' money perception: a study on values and quantity

Gianluigi Guido, M. Irene Prete, Luigi Piper, Antonio Mileti²³

Abstract

While perceiving monetary quantities, consumers tend to lose their ability to estimate an exact amount of money. There exists a specific misleading effect, referred to as quantity distortion, which influences consumers while they perceive an amount of money. This effect leads consumers to lose their ability to correctly estimate quantity and value of cash money— and, likely, its value – as its amount increases. The objective of the present study, aimed at exploring these misleading effects, is to evaluate the perception and accuracy in estimating the quantity of money, as monetary quantities and banknote denominations vary – and, mainly, identifying the threshold value beyond which individuals tend to wrongly estimate quantities of money. Results showed that, even for small monetary quantities, individuals are not able to correctly represent and evaluate monetary quantities. Specifically, under a specific threshold value, an overestimation effect exists, and over a specific threshold value, an increasing underestimation effect occurs. The difficulties in evaluating not only large sums but also small quantity of money and the inability to consider proportionality proved the existence of a quantity distortion effect, that is a generalized tendency to overestimate or underestimate the real extent of monetary quantities. The present study has remarkable implications. From a theoretical viewpoint, it introduces an innovative element in the field of consumers' perceptual distortions, showing that, besides contextual conditions bounding rationality of consumption choices, an increasing underestimation effect and an increasing overestimation, defined as a quantity and a value distortion, needs to be considered. From a managerial perspective, this study has potential consequences in the marketing field, and, specifically, in pricing strategies of luxury and investment goods and in psychological threshold value price strategies.

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Neuromarketers' profile: a study of consumer neuroscience professionals' backgrounds

P. Almiron-Chamadoira²⁴

Abstract

To date it has been a little agreement on what is called 'neuromarketing' and its practitioners, the 'neuromarketers'. This is part of a field in which neurosciences and other disciplines converge, like marketing and subsidiary social sciences and economics. Central to this discipline is the professional profile of its developers. No research has been found that gives account of the profile of what is called neuromarketers. Which is the academic background and work experience that can respond to the neuromarketing intersection? Who are these professionals capable to face traditional market research studies and analyse fMRI results? This paper was designed to determine the professional background, education and work experience of the most influential professionals on neuromarketing from the academia and the industry. It examines the neuromarketers' education background, their work experiences and publications to describe regularities and differences in their expertise and the particularities of it as a group.

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What counts most?

How price, country of origin and nationality dynamically affect consumer preference

Dalia Bagdziunaite²⁵, Anne Strande Jensen, Julie Auning-Hansen, Jesper Clement, Thomas Zoëga Ramsøy

Abstract

Framing is a well-established research method in neuroeconomics and consumer neuroscience. Framing effects of price, country of origin (CoO), and brands have all been demonstrated in many different conditions. However, our knowledge of framing effects woefully lacks any understanding of the relative strength of these effects, and how they may dynamically interact. To abate this problem, we conducted an experiment in which we recruited participants from three regions (Italy, France and rest of world), to undergo wine testing and rating of wine taste preference, and willingness to pay (WTP) while being exposed to the CoO and price of each wine. Unbeknownst to the participants, they all tasted the same wine. To provide a better understanding of the underlying mechanisms of the observed effects, emotional arousal was assessed using pupillometry. Using a linear regression model, our results demonstrate that price and CoO individually have a significant effect on the hedonic experience of wine ($R^2=0.11$, $p<0.0001$). Two-way interactions demonstrate that price has a differential effect on preference depending on CoO. Here, we also find that preference is highly correlated with subjects' WTP for the wine. Finally, we show that WTP is differentially affected by price and CoO depending on nationality. By studying the relationship between arousal and WTP, we find that during framing, pupil dilation is positively related to subsequent WTP, while during product evaluation; this relationship was negative. Taken together, our results demonstrate that branding effects can have both individual and dynamic effects that may depend on the recipient's background. Furthermore, our results suggest that framing is related to a dynamic response that is different for the framing and product evaluation time points. This provides hints for how framing effects can be studied and managed in both academic and commercial settings.

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Like it or not: physiological correlates of brand attitudes

Shannon Bosshard, Jesse Bourke, Monika Koller²⁶, Julia Meier, Peter Walla

Abstract

As companies and researchers strive to better understand consumer behaviour, the need to employ more comprehensive and accurate measures is emphasised. In particular, the use of objective methods that do not require any explicit responses that are potentially biased is suggested. The present study used electroencephalography (EEG), an objective measure of brain activity, to describe the spatio-temporal pattern, in other words the dynamics of neural processes that underlie attitudes towards brands. During the initial phase of the experiment, participants were required to complete a survey and rate their attitude towards 300 brand names. After having recorded these ratings, an individual brand list was created for each participant. In the second phase of the experiment, participants were required to enter the laboratory and again provide a rating of their attitude towards each brand (baseline explicit rating). In addition, brain potentials were recorded via electroencephalography (EEG) while participants viewed all brand names. Interestingly, brands that were rated more positively (via self-report) were seen to elicit less negative brain potentials over the right frontal hemisphere than brands that were rated negatively. This finding strongly confirms the usefulness and reliability of objective measures to investigate marketing-relevant attitudes as in likes and dislikes related to brand names. Future investigations will show whether this approach is also improving our understanding of attitude changes as a consequence of evaluative conditioning.

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Chronic stress promotes risk loving behavior in young adults

Smarandita Ceccato²⁷, Brigitte M. Kudielka, Christiane Schwieren

Abstract

Chronic stress, the consequence of prolonged exposure to one or multiple stressors, is a public health problem that affects a significant part of the population. While the bodily “wear-and-tear” caused by chronic stress is under thorough investigation, its cognitive effects, especially those affecting decision making processes, have not been systematically investigated. This preliminary study examines if chronic stress influences economic decision making under risk. We expect to find behavioural differences between chronically stressed and non-chronically stressed individuals, as chronic stress is known to affect neurological structures involved in learning, memory and decision making. To our knowledge, we are the first to investigate this relation. 213 young adults (< 33 years old) performed a task investigating decision making under risk through financially incentivized lotteries (without feedback) and responded to the Trier Inventory of Chronic Stress (TICS). The risk task includes a wide range of probability distributions and payoffs, offering the possibility to examine financial risk attitudes. We used the exam period of the winter semester as a “natural” chronic stress treatment. Parametric variation of chronic stress period (pre-stress group and stress group) and number of observations (repeated observations, i.e., pre-stress and stress period, and single observations, i.e., one of the two periods) allowed us to directly compare risk taking behaviour in various chronic stress clusters. We uncovered a significant, positive correlation between chronic stress and risk taking. This relation is further emphasized by group comparisons, as individuals that report higher specific chronic stress take significantly more risk than those reporting lower stress levels. The results show that chronic stress might be affecting economic decision making under risk. Further research with respect to generalizability and uncovering the underlying mechanisms is necessary.

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Neural signatures of interpersonal trust: a coordinate-based meta-analysis

Sergey Chernyak, Kimberly Goodyear, Frank Krueger²⁸

Abstract

Interpersonal trust pervades nearly every social aspect of our daily lives, from personal relationships to organizational interactions encompassing social, economic, and political exchanges. Several studies have examined the neural signatures of isolated psychological components of trust during an economic exchange by using the trust game paradigm and a couple of descriptive meta-analysis studies have explored the biological basis of trust from a larger perspective; however, the underlying neural architecture of trust is still not well understood. Here, we examined the neural network of trust using a coordinate-based meta-analysis approach (i.e., activation likelihood estimation method). We tested the hypothesis that trust is a cognitive-affective-motivational process that recruits domain general large-scale brain networks associated with different components of trust: default network (cognitive component), salience network (affective component), and reward network (motivational component). We observed consistent maxima in the hypothesized brain networks, including default-mode network (medial prefrontal cortex, mPFC; posterior cingulate cortex, PCC), salience network (anterior insula, AI; anterior cingulate cortex, ACC), and reward network (dorsal striatum [putamen, caudate]; ventral striatum [nucleus accumbens]). Our results favor the assumption that trust can be defined as a psychological multi-component state. A decision to trust is likely initiated due to social inferences mediated by the medial PFC and PCC about the trustworthiness of a trustee anchored in the default-mode network (cognitive component). The subsequent willingness to trust leads to an emotional feeling of being vulnerable to the risk of betrayal, which is mediated by the salience network (affective component). The AI marks the salience of the emotional feelings and initiates appropriate control signals that are monitored by the ACC. Given that a future reward is anticipated, the reward network (motivational component) contributes to a decision favoring trust, in which the dorsal striatum initiates the selection and the ventral striatum acts as a motivational engine reinforcing the continuation of the behavior in the future. In conclusion, to the best of our knowledge, this is the first coordinate-based meta-analysis on interpersonal trust that has provided evidence that the behavioral correlation of trust can be described as a cognitive-affective-motivational process, whose components are anchored in functionally distinct coupled large-scale brain networks.

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Effect of meditation on consciousness and human health as assessed by psycho-immune correlates

Amla Chopra²⁹, Vineeta Mathur, Sandeep Paul

Abstract

In this investigation, we establish bilateral communication between central nervous system and immune system on the basis of (i) IgA determination in saliva (ii) psychological test. The determination of IgA is accomplished by collecting saliva of subjects by non-invasive method. Ig A levels are then studied against the scores of psychological test of same subjects which in turn reflect the effect of meditation on the individual subject.

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Neuroeconomic studies from an investment environment simulation

Roberto Ivo da Rocha Lima Filho³⁰, Armando Freitas Rocha, Eduardo Massad

Abstract

The scope of this work is concerned to neuroeconomics, presently a new approach in modeling decision-making of graduate participants, by simulating a trading environment. Within neuroscience, it is known that people take prices as anchors as observed in some seminal work from Miller (1956), Parducci (1965) and thereby suggests that this is no different within the financial market. In behavioral finance, anchoring is seen as a behavioral bias, that is, there is a heuristic process to formulate some kind of judgment, as already envisaged in the work of Tversky & Kahneman (1981). The evaluation of the acceptance of a certain decision – financial or not - is strongly linked to risk and benefit analysis calculated by these agents, underpinned by the neuropsychological aspects of the emotional space of decision (ED), which are the Evaluation of Rewards System, taking into account the levels of dopamine (DA), the System of Risk Assessment, the levels of serotonin (5HT) and the System of Approach and Escape that uses, information about expected reward and risk calculated previously in order to determine the closeness or remoteness of the environment need generator. The main objective of this work is then to map brain activity using a technique developed by Rocha et al (2001, 2004 and 2010), operating a simulation of trading within the BMF&Bovespa, in order to better understand the process of neurodynamics decision making in the capital market, through mapping the brain activity recorded from the electroencephalogram (EEG) that allows the study of the process of decision-making both in simulated conditions as real. It is known that there is the involvement of a wide network of neural circuits involved in risk assessments, benefit, conflict, intentionality, etc. (this weighting is closely related to serotonin neural circuits in the event of risks and benefits in the case of dopamine). The analysis of the EEG epochs is associated with specific moments of the cognitive task under study and allows its characterization by Principal Component Analysis (PCA) through major patterns of brain activity underlying the solution of the task at hand. Understanding the functionality of such systems is of fundamental importance for understanding the dynamics of the financial market, ie to record the perception of each individual in relation to the general market sentiment.

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Neural evidence on the role of conflict monitoring in choice-induced preference change

Sabine Hügelschäfer³¹, Carlos Alós-Ferrer

Abstract

We measured response times and electrocortical activity in the human brain to investigate the processes underlying choice-induced preference change. Participants were 40 university students whose EEGs were recorded while they first rated their preferences for a set of items (holiday destinations and female first names), then chose (hypothetically) between several pairs of items that had been rated equally or very similarly in the pre-choice rating task, and then re-rated their preferences for all the items. We observed significant positive spreading, that is, consistent adjustments in post-choice ratings conditional on whether a choice option had been selected or not. Choices were faster for pairs for which one alternative had been rated higher compared to pairs with equally rated alternatives. The amount of spreading was significantly associated with an individual's amplitude of the N2 component of the EEG, an electrophysiological index of conflict monitoring by the anterior cingulate cortex which has been related to interindividual differences in sensitivity towards response conflict. Further, a high score in the personality trait of neuroticism was associated with a more pronounced positive spreading. Our results support cognitive dissonance theory and provide information on the mechanisms underlying choice-induced attitude change. The findings support the assumption that the change in attitudes is driven by the experience of conflict between different cognitions when deciding between equally attractive alternatives. The correlation between N2 amplitude and spreading suggests that choice-induced preference change is directly related to sensitivity to the conflict that arises from the required choice between two similarly attractive options. This result implies that dissonance-induced preference change is based on the same mechanisms that are involved in conflict monitoring and recruitment of control systems.

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The household planning game -

assessing everyday risk taking with a novel gambling task using eye-tracking to measure the effect of visual attention during trials

Louise Koch³², Thomas Zoëga Ramsøy, Marcus Nyström

Abstract

Two common reasons why people end up in personal financial problems are either because they have not learned to manage a budget, or because they have unrealistic expectations of what they can afford to buy. To assess potential level for risk-seeking behavior in daily life, we created a novel test - The Household Planning Game (HPG) - modelled upon the well-known Iowa Gambling Task (IGT). The basic foundations of the HPG were largely the same as the IGT, however illustrations of consumer goods were positioned at the top of the cards, and the participant's task was to select a card as if it was a natural shopping or budget planning situation. The selection of a card was associated with a monetary reward, but the card selection was also associated with a risk of receiving a penalty, which could be greater than the reward. The aim was to win as much money as possible. Rewards and penalties were modelled on the same schedule as in the IGT. Eighteen university students performed the HPG, which was separated into three conditions containing 100 trials. During the game, participants were asked to; 1) pay a number of fixed monthly costs or save money for various household costs; 2) purchase a number of consumer goods like groceries or presents; and 3) prioritize between paying bills at the beginning of a month or go out and spend money on shopping. Eye tracking was used to assess visual attention while participants performed the task. The results showed that the two non-risky decks were selected 30% and 37% of the times, respectively – a result very similar to healthy participants in the IGT (Bechara et. al., 1994). Interestingly, when looking at the eye-movement data, participants spent more time looking at risky cards, even if a good card is selected. We conclude that 1) the HPG can function as an ecologically valid alternative to the IGT; 2) participants in the current study were not highly potential risk-takers; and finally 3) that eye tracking during an IGT/ HPG can provide useful information about potential risk-seeking cues.

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Happy and in charge:

how moods affect the illusion of control

Nausheen Niaz³³, Catrine Jacobsen, Clara Zeller, Jeffrey Lins, Thomas Zöega Ramsøy

Abstract

Key findings from decision neuroscience question the basis of the rational decision-maker and show that far from all aspects influencing decision-making are controllable in the sense of being shaped or guided through conscious deliberation. So where does this illusion of control come from and what influences it? In this paper, we investigate the correlation between affective states, risk taking and the illusion of control, trying to understand how emotions and mood affect risk taking behavior and decision-making through a stock trading study. We find that moods have a dynamic relationship to the experience and illusion of control.

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The effectiveness of neurofeedback (HEG) to reduce impulsive buying behaviour

Gerhard Raab, Kathrin Paul, Lena Anna Weichenmeier³⁴

Abstract

Near infrared Hemoencephalography (nirHEG) is a non invasive neurofeedback training technique to picture brain activity in the human frontal lobe due to the concentration of hemoglobin. It's application ranges from therapy for ADHS/ADS, autistic spectrum disorders to traumatic brain injuries and research provides scientific evidence for the effectiveness of nirHEG training to especially reduce impulsivity (Hoshi, 2003; Toomim et al., 2004; Coben et al., 2010, Gonzáles-Castro et al., 2013). The current study addresses the effectiveness of nirHEG training in impulsive buying behaviour as well as in different vegetative functions and certain aspects of buying behaviour, eminently the willingness to pay (WTP) and the amount of product purchase. The heartrate variability in the low frequency range (HRV%LF) as well as the respiration/heart rate coherence (RSP/HR coherence) were observed and systematically evaluated. The results indicate a significant improved blood flow in the study sample ($n=11$) on Fpz after 8 weeks of nirHEG training of 6% ($t(10)=3.91$; $p=.003$) and in addition 4 out of 11 persons exhibit a 36% better fluctuation of the nirHEG signal on Fpz ($t(10)=1.33$; $n.s.$). Significant improvements of 42% on HRV%LF ($t(10)=-3.72$; $p=.004$) and a significant increase within RSP/HR coherence ($t(10)=-3.65$; $p=.004$) were demonstrated from the first to the last training session. Neither questionnaire data nor shopping behaviour changed significantly during nirHEG training. This may be due to the fact that the participants did not show any uncontrolled or impulsive behaviour at the origin measure point. We will continue further research to shed light on the impact of neurofeedback training by means of nirHEG to enhance controlled and intentional buying behaviour. And furthermore to derive scientific support for the implementation of a special developed neurofeedback training for impulsive and uncontrolled buying behaviour.

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The relationship between moral judgment and intertemporal choice

Manuela Sellitto³⁵, Elisa Ciaramelli, Giuseppe di Pellegrino

Abstract

During intertemporal choice, people consider payoffs of both short- and long-term interests in prior to decide between smaller-sooner and larger-later rewards. Moral judgment, the ability to decide if action can be deemed as moral or immoral, is often intertemporal, requiring considering short- vs. long-term consequences of action. We investigated the relation between intertemporal choice and moral judgment in healthy young adults. Intertemporal choices involved larger-later reward against smaller-immediate or smaller-sooner monetary reward. Moral judgments included impersonal dilemmas, where violations did not involve one's own agency, and personal dilemmas, where violations involved one's own agency. Crucially, increased preference for immediate economic gratification was accompanied by increased willingness to accept personal and impersonal violations, and by reduced time to accept personal violations. We suggest that, once a common mechanism of anticipating consequences and emotions associated with action is less efficient, individuals are unable to make long-sighted choices, thus being less willing to wait longer for more convenient monetary reward, and unable to envision future negative consequences of being the agent of immoral action in the immediate present.

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Decision making diagnosis within aero-space sector

Cristian Vizitiu³⁶, Vlad Văleanu, Adrian D. Tanțău, Ruxandra F. Vizitiu, Vladimir Vasiliu, Mihaela Marin, Alexandru Nistorescu

Abstract

The triggering cause of the present research is given by the high level of complexity in the technical projects carried out by means of Systems Engineering (SE) methodology, and implicitly by the well acknowledged needs in the field for more advanced decision making tools to increase the projects efficiency. Therefore, the present study provides a conceptual decision making diagnosis model for SE, entitled DiagnoSE, based on the Cognitive-Emotional and Explicit-Tacit knowledge dyads, and accommodated on a three level Analytic Hierarchy Process (AHP) mathematical structure, emphasizing the goal of increasing decision making efficiency within SE. Based on the principle that distinguishes the first dyad as a mechanism for accessing knowledge from the second dyad, DiagnoSE has the practical utility to diagnose by numerically quantified pair wise comparisons, the SE professionals' predisposition of appealing at criteria as rationality, emotionality or standardized project procedures within critical decisions making, and as well to diagnose the knowledge dynamics within the SE interdisciplinary teams in order to identify the right activities which support each criterion to enhance decision making process. DiagnoSE has been applied also as an empirical research upon 197 SE decision makers within Romanian aero-space sector in order to demonstrate its valuable contribution in the SE management efficiency. The empirical research revealed notably results and hence, it provides a new perspective upon both diagnosing decision making in the frame of NeuroPsychoEconomics, and as well upon research and development SE projects.

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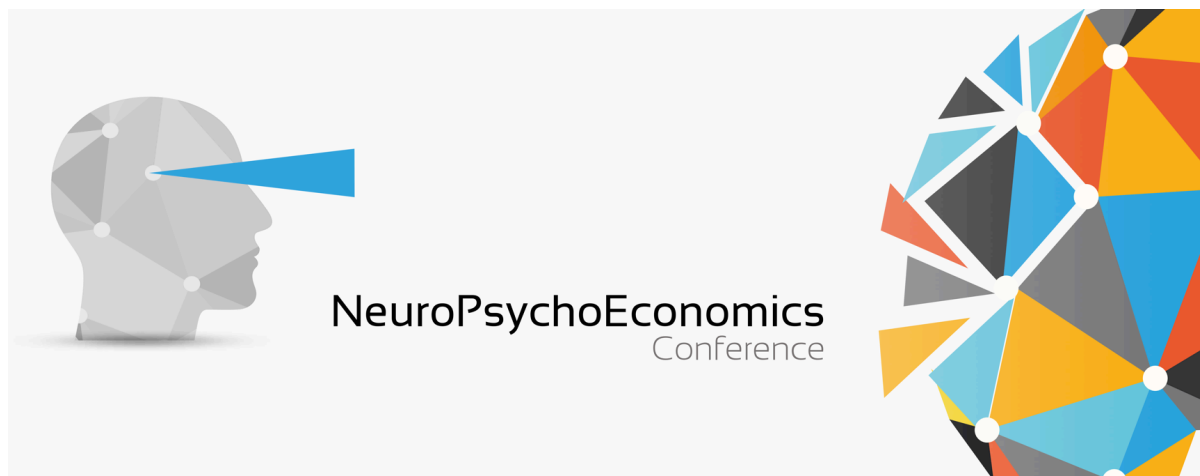
Implicit communication in brand management as a critical success factor

Lisa Wisnewski, Christian Chlupsa³⁷

Abstract

Every decision human beings make in their daily lives is guided by intrinsic motivations. Hence, buying behavior is not arbitrary - it is predictable. In the role of customers, people are attracted by the physical assets of a product. But what plays an even more important role is the perception of the brand, which can be influenced by implicit messages. Thus, marketers can affect decision-making to a significant degree. The impact and current management of brands and implicit communication was primarily examined through the example of Activia, a brand at Danone, and additional competitors from the dairy product industry. The thesis identified and analyzed the implicit codes of current brand communications as well as the manifestation of implicit motives in sixty yogurt customers with OMT an implicit measuring tool, in order to contrast the collected data and deduce the most promising communication strategy for Activia. Results from this investigation indicated that the implicit codes in the advertising did not match the dominant implicit motivation of the customers, be it affiliation, power or achievement. These findings indicate that Activia's and its competitors' current positioning strategies does not optimally influence consumer decisions, as they do not consider current neuropsychological insights. Based on these study findings brand managers should take these neuropsychological insights into account and restructure their positioning and brand codes in order to improve a marketing strategy's effectiveness.

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2015 Call for papers

We are happy to announce that submissions are now open for the 2015 NeuroPsychoEconomics Conference in **Copenhagen, Denmark**. The conference will be held from **June 18-19, 2015** at Copenhagen Business School (Solbjerg Plads 3, DK-2000 Frederiksberg, Denmark). The conference co-chair is **Thomas Zoëga Ramsøy**. The **deadline for submissions is April 20, 2015**.

The conference theme of 2015 is:

“The Next 10 Years: Trends in Neuromarketing, Neuroeconomics, Neurofinance, and Related Disciplines”

Manuscripts should combine concepts from neuroscience and/or psychology with problems in economics, marketing, business, management, or finance. Topics may include (but are not restricted to):

- application of concepts and methods from neuroscience and/or psychology in solving problems in economics, marketing, business, management, or finance (e.g., behavioral economics, consumer behavior/consumer psychology, decision science, behavioral finance, and organizational behavior),
- analysis of interpersonal and social behavior with the means of neuroscience and/or psychology (e.g., social neuroscience and cultural neuroscience),
- evaluation of the state of the field of research in neuroeconomics, decision neuroscience, consumer neuroscience, neuromarketing, neurofinance, and organizational neuroscience,
- discussion of ethical and legal issues at the interface of psychology, neuroscience, and business/economic research, and
- presentation of state-of-the-art methods for investigating neuroeconomic problems (e.g., fMRI, TMS, DTI, EEG/ERP, SCR, genetics).

Both empirical and conceptual manuscripts are welcome. The conference language is *English*.

Pre-Conference

A pre-conference workshop will be held on **Thursday, June 18, 2015** starting at 2PM. Attendance is *FREE* for registered conference participants! This workshop will feature interactive lectures by researchers from Copenhagen Business School. Please see details in the conference program, released in May 2015.

(continued on next page)

Competitive paper submissions

- Manuscripts for the 2015 NeuroPsychoEconomics Conference must be submitted **by April 20, 2015**. The submission portal can be found at <http://www.jnpe.org> (under “Conference” and “Submissions”).
- 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) will go through a double-blind peer review process. Full paper submissions must be accompanied by a cover letter that indicates the intention to publish the paper, if accepted, either in its entirety in the *Journal of Neuroscience, Psychology, and Economics* (ISSN 1937-321X) or in abstract form in the *NeuroPsychoEconomics Conference Proceedings* (ISSN 1861-8243). Full paper submissions must include a short abstract of no more than 350 words and conform to the author guidelines of the American Psychological Association (APA). Please see <http://www.jnpe.org> (under “Conference” and “Submissions”) for more submission information.
 - *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 include a separate short abstract of no more than 350 words (for publication in the *NeuroPsychoEconomics Conference Proceedings*, ISSN 1861-8243) and conform to the author guidelines of the American Psychological Association (APA). Please see <http://www.jnpe.org> (under “Conference” and “Submissions”) for more submission information.
- All cover letters must include the full names and affiliations of all coauthors as well as the e-mail address of the corresponding author.
- **In submitting a manuscript, the authors affirm that, if accepted, at least one author will register for the 2015 NeuroPsychoEconomics Conference and appear at the conference to present the paper.**

Poster submissions

- Posters for the 2015 NeuroPsychoEconomics Conference must be submitted **by April 20, 2015**.
- Poster submissions will go through an expedited review process. They must be accompanied by a cover letter that clearly states “poster submission,” an extended abstract (up to 1,500 words) that describes the research presented on the poster, and a short abstract (up to 350 words) for inclusion in the *NeuroPsychoEconomics Conference Proceedings* (ISSN 1861-8243). The extended abstracts for the poster submissions must conform to the author guidelines of the American Psychological Association (APA). Please see <http://www.jnpe.org> (under “Conference” and “Submissions”) for more submission information.
- The cover letter must include the full names and affiliations of all coauthors as well as the e-mail address of the corresponding author.
- If accepted, posters to be presented at the conference may have a maximum size of 120 cm (width) x 90 cm (height).
- **In submitting a poster, the authors affirm that, if accepted, at least one author will register for the 2015 NeuroPsychoEconomics Conference and appear at the conference to present the poster.**

We look forward to your submissions and to seeing you in Copenhagen!

Membership & mailing list

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