

The Book of Abstracts

Department of Cognitive Science Jagiellonian University

1st International Krakow Conference in Cognitive Science

Przegorzaly, 27-29 September 2012

Editor: Sebastian Tomasz Kołodziejczyk

Krakow 2012

About the Conference

The 1st International Krakow Conference in Cognitive Science: Consciousness and Volition focuses on the current state of consciousness research, with particular reference to connections with issues pertaining to volitional acts. Principal topics include: mental acts of volition, perception, memory, gualia, emotions, as well as the neurophysiological and physical foundations of all of these. We also set out to analyse the possibility of artificial modelling of such mental acts, and correlations between them and experimentally discoverable events. The program of the conference, which is envisaged as having an interdisciplinary flavour, is not, however, limited to just these themes and presentations. It is hoped that it will include a wide-range of related topics and innovative approaches, even where these involve research with an explicitly interdisciplinary orientation. One of the most important challenges that this conference aims to address is that of bridging the explanatory gap between first-person experience, psychological research and the various ways in which the brain itself may be studied.

The conference is organized by the Institute of Philosophy, Jagiellonian University in cooperation with the Institute of Psychology, Jagiellonian University and the AGH University of Science and Technology in Krakow.

On behalf of the Scientific & Organizing Committees we are happy to welcome you to Krakow.

Józef Bremer, Chair of the Scientific Committee Sebastian T. Kolodziejczyk, Chair of the Organizing Committee

Scientific & Organizing Committee Members

Józef Bremer - Chair of the Scientific Committee Adam Chuderski Stefan A. Florek Sebastian T. Kołodziejczyk - Chair of the Organizing Committee Grzegorz J. Nalepa Magdalena Senderecka Tomasz Smoleń Michał Wierzchoń Anna Anzulewicz Bolesław Czarnecki Justyna Michniak Błażej Skrzypulec - Secretary of the Board Tomasz Szubart

Conference Venue & Lodging

The 1st International Krakow Conference in Cognitive Science is held in Przegorzały.

The Conference Venue is situated on a hill and a beautiful, secluded spot in the Wolski Woods, the Przegorzały Guesthouse offers excellent surroundings for work, recreation and leisure and provides many opportunities to watch nature, including birds, deer and squirrels. Those who like hiking, may choose to follow many routes leading to, among other places, the Camaldolese monastery, the Jagiellonian University astronomy observatory in Bielany, the Marshal Piłsudski Memorial Mound and the ZOO. In the surrounding forest there are many rare plants, classified 0.

Invited Lectures and Scientific Sessions will be held in the Przegorzały Castel that is located a few steps from the University Guesthouse where the conference participants will be accommodated.

Lodging (Only Full Registration):

University Guesthouse. All the rooms have private, well equipped bathrooms with toilets.

Breakfasts, lunches, dinners, and welcome reception will be held in the University Guesthouse Restaurant.

All registered participants are welcomed to the Poster Session and Welcome Reception that will be held in the University Guesthouse on Thursday, 27th at 18.00.

Official Conference Dinner will be held on Friday, 28th at 20.00 in the "Wesele" Restaurant, Rynek Główny 10, 31-042 Krakow, Phone: 0048 (12) 4227460. Transportation to and from the Restaurant will be provided.

Address of the Przegorzały Castle and the University Guesthouse:

ul. Jodłowa 13 30-252 Kraków, Poland, Phone: +48 (12) 429-71-15

Transport to & from the University Guesthouse in Przegorzały

FROM BALICE AIRPORT

TAXI from the airport to the University Guesthouse in Przegorzały (8 km) costs about 50 zł, call (0) 800 19 19 19.

BUS no. 292 to the Hotel Cracovia, there transfer to bus no. 109 and get off at ulica Jodłowa.

BUS no. 209 from the Balice bus stop (by the army garrison), which runs to Salwator via Przegorzały.

FROM THE MAIN TRAIN AND BUS STATION

TAXI from the city center to the Przegorzały Guesthouse (4 km) TRAM no. 2 to Salwator (end of the line). Transfer there to one of the following buses: 109, 209, 229, 239, 249, 259, 269, 279, 289, 299

TICKETS AND TIMETABLE

The tickets are the same for trams and buses, and so are their prices. Here is a table of ticket prices.

You can buy a ticket in most stationaries and in ticket vending machines. The ticket vending machines can be found in most of the stops in the centre, in other major stops (usually start/end stops of trams) and in some trams and buses (all the new buses and trams have one).

Ticket vending machines in trams and buses sometimes do not accept amount of money which would require a change, especially when it is 0,05 zł, so it is good to have the exact amount of money you need to buy a ticket The complete timetable is available under this address: rozklady.mpk.krakow.pl.

SELECTED TAXI OPERATORS & CALL CENTERS:

Taxi Barbakan - 196-61 Mega Taxi - 196-25 Dwójka Taxi - 196-22

Detailed information about the Krakow's famous attractions you may find at the website: http://www.krakow.pl/english/

Conference Programme (Short Version)

Wednesday (26.09.2012) 18.00-20.00 (6pm-8pm) Registration of participants at the Venue (University Guesthouse)

Thursday (27.09.2012)

8.30-9.30 Registration of participants at the Conference Venue (Przegorzały Castel) 9.45-10.00 Room 1.12 Welcome Address - Józef Bremer (Jagiellonian University)

Morning Session

10.00-11.00 **Room 1.12** Invited Lecture: Bernhard Hommel (Leiden University), Chair: Józef Bremer & Sebastian T. Kołodziejczyk. 11.00-11.15 Coffee break

Parallel Sessions

Section I Room 1.12 11.15-12.45 Section II Room 1.22 11.15-12.45

13.00-15.00 Lunch & Rest (at the University Guesthouse)

Afternoon Session

15.00-16.00 **Room 1.12** Invited Lecture: Peter Halligan (Cardiff University), Chair: Bernhard Hommel. 16.00-16.30 Coffee Break

Parallel Sessions

Section I Room 1.12 16.30-18.00 Section II Room 1.22 16.30-18.00

18.30-20.30 **Poster Session & Welcome Reception** (at the University Guesthouse Restaurant)

FRIDAY (28.09.2012)

Morning Session

10.00-11.00 **Room 1.12** Invited Lecture: Zdzisław Kowalczuk (Gdansk University of Technology), Chair: Peter Halligan. 11.00-11.15 Coffee break

Parallel Sessions

Section I Room 1.12 11.15-12.45 Section II Room 1.22 11.15-12.45

13.00-15.00 Lunch & Rest (at the University Guesthouse)

Afternoon Session

15.00-16.00 **Room 1.12** Invited Lecture: Thomas Metzinger (Johannes Gutenberg-Universität Mainz), Chair: David Papineau. 16.00-16.30 Coffee Break

Parallel Sessions

Section I Room 1.12 16.30-18.00 Section II Room 1.22 16.30-18.00

20.00 **Official Conference Dinner** (in Kraków, Restaurant Wesele, Rynek Główny 10, transportation from Przegorzały provided, departure 19.30)

SATURDAY (29.09.2012)

Morning Session

10.00-11.00 **Room 1.12** Invited Lecture: David Papineau (King's College London), Chair: Thomas Metzinger. 11.00-11.15 Coffee break

Section Session

Section Room 1.12 11.15-12.45

12.50 Room 1.12 Closing Address13.15 Lunch (at the University Gueshouse)

End of the Conference

Conference Programme (Detailed Version)	'ednesday (26.09.2012) 18.00-20.00 (6pm-8pm) Registration of participants at the Venue (the University Guesthouse in Przegorzały)	Тникърау (27.09.2012)	30-9.30 Registration of Participants at the Conference Venue (the Przegorzały Castle) 45-10.00 Room 1.12 Welcome Address - Józef Bremer, Chair of the Scientific Committee.	Morning Session	0.00-11.00 Room 1.12 Invited Lecture: Bernhard Hommel (Leiden University), How we do what we want: An ideomotor approach to duntary action, Chair: Józef Bremer & Sebastian T. Kołodziejczyk. .00-11.15 Coffee break	Parallel Sessions	ction I Room 1.12 Action, Volition, and Free Will, Chair: Godehard Bruentrup (Philosophy School, Munich) .15-11.45 Kevin Lynch, THE ROLE OF INTENTIONAL ACTION IN SELF-DECEPTION .45-12.15 Anco Peeters, AN OPERATIONALIZATION OF FRANKFURT'S CONCEPTION OF FREE WILL 2.15-12.45 Anita Pacholik-Žuromska, THE FIRST PERSON AUTHORITY AND THE DETERMINISM OF THE WILL	c ction II Room 1.22 Higher Order Processes, Chair: Adriana Schetz (Szczecin University) .15-11.45 Ellen Fridland, IMITATION, SKILL LEARNING, AND CONCEPTUAL THOUGHT: AN EMBODIED, DEVELOPMENTAI PPROACH .45-12.15 Sofia Stein, THINKING ABOUT THOUGHTS: ADVANCE OR REGRESSION? 2.15-12.45 Ada Witenberg, AGENTIAL ASPECTS OF INTROSPECTION
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13.00-15.00 Lunch & Rest (at the University Guesthouse)

Afternoon Session	15.00-16.00 Room 1.12 Invited Lecture: Peter Halligan (Cardiff University), Consciousness and Volition: Insights from Neuropsychology, Chair: Bernhard Hommel. 16.00-16.30 Coffee Break	Parallel Sessions	Section I Room 1.12 Motivation, Volition, and Axiology. Chair: Anita Pacholik-Żuromska (Nicolai Copernicus University, Toruń) 16.30-17.00 Godehard Bruentrup, MOTIVATION, VOLITION, AND CONSCIOUSNESS 17.00-17.30 Silvia Galikova, IN THE WONDERLAND OF CONSCIOUS WILL 17.30-18.00 Przemysław Piotrowski & Stefan Florek, AUTOMATISM OF EVIL – THE ILLUSION OF CONTROL AND (UN)CONSCIOUS MOTIVATION IN JUVENILE DELINQUENTS	Section II Room 1.22 Varieties of Representation, Chair: Adam Chuderski (Jagiellonian University) 16.30-17.00 Robert Clowes, VIRTUALIST REPRESENTATION AND THE COMPOSITION OF PRESENCE 17.00-17.30 Grzegorz J. Nalepa, REMARKS ON THE EVOLUTION OF STRUCTURAL KNOWLEDGE REPRESENTATIONS IN ARTIFICIAL INTELLIGENCE	18.30-20.30 Poster Session & Welcome Reception (at the University Guesthouse)	Posters:	Sandra Andraszewicz, THE NFLUENCE OF COVARIANCE ON THE CHOICE PROBABILITY - APPLICATION OF DECISION FIELD THEORY Ondrej Beeev, AWARENESS OF INTENTION: THE PHENOMENA AND ITS NEURALCORRELATES Sofya Belova & Evgeniya Gavrilova, USAGE OF PERIPHERAL INFORMATION IN PROBLEM SOLVING AND GENERAL ABILITIES Sofya Belova & Evgeniya Gavrilova, USAGE OF PERIPHERAL INFORMATION IN PROBLEM SOLVING AND GENERAL ABILITIES Evgeniya Gavrilova, BECOMING ACADEMIC SCIENTIST: THE MODEL OF PSYCHOLOGICAL FACTORS CONTRIBUTING TO ACADEMIC ACHIEVEMENT Midah Wierzchoń, Bet Windey, Krzysztof Goeiewicz, Marcin Koculat, Axac Clevenanas, TRAINING SUBJECTIVE EXPERIENCE IN BINOCULAR RIVALRY Vulia Kovaleva, GOGNITIVE, VOLUNTARY AND EMOTION AL CONTROLS AND FAMILYSYSTEM'S FEATURES IN THE STRUCTURE OF JOINT B Lukasz Lazar, META PROBLEM AND PROBLEM OF COMPLEXITY AGAINST FREE WILL ANDPROBLEM OF NORMATIVITY Jaison Manjaly, DO HIGHER ORDER MOTIVES AFFECT ATTRIBUTION OF AGENCY? Yuri Okulovsky, ONLINE SHOOTER GAME AS A POLYGON FOR THE COGNITIVE ANDSOCIAL EXPERIMENTS Thomas Urbanek, Vladimir Marcek, COGNITIVE TRADSIA: GANDER AND SOME IMPLICATIONS Thomas Urbanek, Vladimir Marcek, COGNITIVE PASIA, GANDE AND SOME IMPLICATIONS
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10.00-11.00 Room 1.12 Invited Lecture: Zdzisław Kowalczuk (Gdansk University of Technology), <i>Systemic Approach to Modelling the Human Brain</i> , Chair: Peter Halligan. 11.00-11.15 Coffee break
Parallel Sessions
Section I Room 1.12 Consciousness, Perception & Emotions, Chair: Marek McGann (Mary Immaculate College) 11.15-11.45 Adriana Schetz, VARIETIES OF PERCEPTUAL CONSCIOUSNESS 11.45-12.15 Józef Bremer, REFLECTIONS ON CONSCIOUS WILL AND VOLUNTARY CONTROL, WITH REFERENCE TO THE EXPERIMENTS OF B. LIBET 12.15-12.45 Daniel Shargel, LOOKING FOR EMOTIONS IN THE BRAIN
Section II Room 1.22 Free and Conscious Will, Chair: Michal Wierzchoń (Jagiellonian University) 11.15-11.45 Asger Kirkeby-Hinrup, SUPERCOMPATIBILISM AND FREE WILL 11.45-12.15 Yaron Senderowicz, DESIRING TO DESIRE 12.15-12.45 Andrzej Stawosz-Krasowski, VOLITION AS A NECESSARY COMPONENT OF ANY POSSIBLE SOLUTIONFOR THE MIND-BODY PROBLEM

13.00-15.00 Lunch & Rest (at the University Guesthouse)

FRIDAY (28.09.2012)

Morning Session

 15.00-16.00 Room 1.12 Invited Lecture: Thomas Metzinger (Johannes Gutenberg-Universität Mainz), Body Representation, Global Control and Self-Consciousness: From Embodiment to Minimal Phenomenal Selfhood, Chair: David Papineau. 16.00-16.30 Coffee Break Parallel Sesions Parallel Sessions Section I Room 1.12 Consciousness and Intentionality, Chair: Grzegorz J. Nalepa (the AGH - University of Science and Technology & Jagiellonian University) 16.30-17.30 Asier Arias Dominguez, CONSCIOUSNESS AND INTENTIONALITY: TROUBLES WITH INSEPARATISM 17.00-17.30 Asier Arias Dominguez, CONSCIOUSNESS AND INTENTIONALITY: TROUBLES WITH INSEPARATISM 17.30-18.00 Paweł Banaś, Bartosz Janik, ARE WEAK-WILLED ACTIONS FREE AND INTENTIONAL? 	Section II Room 1.22 Varietes of Cognitive Abilities. Magdalena Senderecka (Jagiellonian University) 16.30-17.00 Femando Martinez-Manrique, RELATIONS BETWEEN FUNCTIONAL AND STRUCTURAL PARAMETERS OF INNER SPEECH 17.00-17.30 Michał Wierzchoń, COULD A PERFORMANCE INFLUENCE SUBJECTIVE AVAILABILITY OF STIMULI? 17.30-18.00 Krzysztof Andrelczyk, Adam Chuderski, Tomasz Smoleń, A COMPUTATIONAL MODEL OF OSCILLATORY MECHANISMS UNDERLYINGINDIVIDUAL DIFFERENCES IN WORKING MEMORY	20.00 Official Conference Dinner (in Kraków, the Wesele Restaurant, Rynek Główny 10, transportation for participants will be provided, departure: 19.30 from the University Guesthouse)
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Afternoon Session

Section Room 1.12 Volition, Consciousness, and Neural Correlates, Chair: Stefan Florek (Jagiellonian University)	10.00-11.00 Room 1.12 Invited Lecture: David Papineau (King's College London), Libet and Conscious Intentions, Chair: Thomas Metzinger. 11.00-11.15 Coffee break
	Section Room 1.12 Volition, Consciousness, and Neural Correlates, Chair: Stefan Florek (Jagiellonian University)

12.50 Closing Address 13.15 Lunch (at the University Guesthouse) End of the Conference

SATURDAY (29.09.2012)

Morning Session

ABSTRACTS

INVITED LECTURES (BY ORDER OF DELIVERY)

HOW WE DO WHAT WE WANT: AN IDEOMOTOR APPROACH TO VOLUNTARY ACTION

Berhnard Hommel (Leiden University)

This talk gives an introduction into the Theory of Event Coding (TEC), which claims that perception and action are not only based on shared (i.e., sensorimotor) representations but are in some sense one and the same thing. Behavioral and neurocognitive studies will be discussed to show how knowledge about possible action goals and action affordances is acquired in infants, children, and adults, how this knowledge is used to select and control intentional action and to anticipate action outcomes, and how it is neurally represented. It will also be discussed how perceived action effects form the basis of our self-concept and the degree to which we experience ourselves as separated from, or part of another person.

CONSCIOUSNESS AND VOLITION: INSIGHTS FROM NEUROPSYCHOLOGY

Peter Halligan (Cardiff University)

Consciousness, defined as subjective awareness is a frustrating construct, superficially self-evident and yet, as James (1892) pointed out, difficult to characterize and define in scientific or functional terms. Despite such challenges, consciousness provided the obvious research platform for many of the early psychologists who came to realize that many aspects of mental processing for which awareness was claimed were in fact the product of prior levels of "unconscious" processing. Converging findings from cognitive neuroscience over the past 30 years has confirmed that all cognitive abilities (from attention to volition) are carried out by a myriad of highly efficient and largely automatic pre-conscious processes that operate outside phenomenological awareness and subjective control. New insights into the normal neural and psychology approach that studies the experience and behavior of individuals where such systems break down after functional or structural damage.

In this talk, I will briefly consider findings from clinical subjects with (a) visualspatial neglect -a clinical condition following right brain damage -commonly considered to be a classic disorder of visual awareness—where "awareness" is equated with the sub-personal psychological construct of attention (Posner, 1978); (b) phantom limb phenomena – a common condition following amputation where sustained awareness of the corporeal limb (often with pain) persists for many years and (c) conversion disorder (hysterical paralysis) – a classic disorder of volition. Finally, will describe some recent studies of experimental neuropsychopathology using hypnotic suggestion to create clinically informed analogues as another potentially productive means of investigating the brain activity involved in symptom-based disorders and their related phenomenology.

SYSTEMIC APPROACH TO MODELLING THE HUMAN BRAIN

Zdzisław Kowalczuk (Gdansk University of Technology Faculty of Electronics, Telecommunications and Informatics Department of Decision Systems)

The presentation gives an account of research results concerning a project of creating a fully autonomous robotic decision-making system, able to interact with its environment and based on a mathematical model of human cognitive-behavioural psychology, with some key elements of personality psychology included. The principal idea of the work is focused on a concept

of needs, with a certain instrumental role of emotions.

BODY REPRESENTATION, GLOBAL CONTROL AND SELF-CONSCIOUSNESS: FROM EMBODIMENT TO MINIMAL PHENOMENAL SELFHOOD

Thomas Metzinger (Johannes Gutenberg-Universität Mainz)

Subjectivity is at the heart of current theories of about consciousness, in neuroscience as well as in philosophy of mind: What is a conscious self? What are the origins of the first-person perspective, and what exactly makes phenomenal experience a subjective phenomenon?

As a philosopher, I am interested in the relationship between body representation and the deep structure of self-consciousness. My epistemic goal in this lecture will be the simplest form of phenomenal self-consciousness: What exactly are the essential non-conceptual, pre-reflexive layers in conscious self-representation? What constitutes a minimal phenomenal self? Conceptually, I will defend the claim that volitional control and agency are not part of the metaphysically necessary supervenience-basis for bodily self-consciousness. Empirically, I will draw on recent research focusing on self-location in the dream state, out-of-body experiences (OBEs), and full-body illusions (FBIs). I will then proceed to sketch a new research program and advertise a new research target: "Minimal Phenomenal Selfhood", ending with an informal argument for the thesis that volition, agency, or "global control", phenomenologically as well as functionally, are not necessary conditions for self-consciousness.

References

Metzinger T. (2006). Conscious volition and mental representation: Towards a more fine-grained analysis. In N. Sebanz und W. Prinz (Hrsg.), Disorders of Volition. Cambridge, MA: MIT Press. S. 19-48.

Metzinger T. (2003). Being No One. The Self-Model Theory of Subjectivity. Cambridge, MA: MIT Press.

Metzinger T. (2009). The Ego Tunnel. The Science of the Mind and the Myth of the Self. New York: Basic Books.

Blanke, O. & Metzinger T. (2009). Full-body illusions and minimal phenomenal selfhood. Trends in Cognitive Sciences, 13(1): 7-13.

LIBET AND CONSCIOUS INTENTIONS (co-written with Marcela Herdova) David Papineau (King's College London)

It is widely supposed that experimental results in the Libet paradigm show that human actions do not depend causally on conscious intentions. This paper argues that this conclusion is unwarranted on two grounds.

First, we argue that the conscious states involved in these experiments do not exhibit the characteristics of normal intentions: they do not bear the right relations to deliberation and practical reasoning. So even if the conscious states in the experiments occur too late to cause actions, it does not follow that conscious intentions themselves cannot cause actions.

Second, we argue that the actions involved in these experiments are peculiar: while most actions have conscious intentions in their causal ancestry, it is unclear whether this is true of the experimental actions. This means that, even if the experimental actions are not caused by conscious intentions, it may still be true that most other actions are.

ORAL PRESENTATIONS (BY ORDER OF DELIVERY)

THE ORCHESTRATION OF ACTION

McGann, M. (Psychology, Mary Immaculate College, Ireland)

In 1896 John Dewey (1896) critically examined the concept of the reflex arc – the idea that psychology and behaviour are sequenced in a manner that begins with a sensation or stimulus, proceeds to some central point where it becomes an idea, and then triggers some result that we consider an action or response. Dewey argues neither stimulus nor response can be described except in terms of the other, that they are two facets of one phenomenon, coordination.

Dewey's logic applies equally well to the domain of agency, where a commonly imposed dualism is that of intention and action. Just as it is impossible to discuss either stimulus or response without reference to the other, so intentions and actions are a complementary air that are inextricable.

We must thus step back and examine the implications of seeing intentions and actions as two facets of a coordination. In dissolving the two into one another in this fashion, we move away from the idea of intentions being psychological states that drive and shape bodily movements to particular, pre-specified ends. Action should be seen, rather, as a judicious and sensitive coordination of the values of the agent (that what motivates the agent) with the constraints imposed by the interaction between body and environment.

This idea can be more fully explicated by drawing on the analyses of skilled activity offered by Tim Ingold (1996) and Erik Rietveld (2008). Ingold (1996) notes that skilled activity involves the sensitive interaction between the craftsman and their materials. Skills action is never simply the implementation of a preconceived plan or intention, but is something more akin to a dance or conversation between artisan and environment. Rietveld (2008) makes a similar argument, describing what he refers to as the "situated normativity" that exists in unreflective skilled action. Situated normativity is precisely that implicit, dynamic structuring of action in the interplay between the various elements of the organism-environment system.

The points made by Rietveld and Ingold, while explicitly focused on the expert craftsman actually apply to a much broader domain of normal action, precisely because so much normal action is built from skills developed over our lives and educations (both formal and informal). From abilities of locomotion or arm movement to the plethora of social, linguistic and cultural capacities practised over the lifespan.

What are the implications of this view for agency? It would appear that there is strong evidence that agency is "soft assembled", and that a large part of the control of action is what Clark (2007) terms "ecological control" - put together on the fly and distributed over space and time, organism and environment. From this perspective actions should be viewed as a continuous process of coordination, an orchestration of movements that emerges dynamically from the interaction of a range of processes. Actions occur not only at a single timescale, that of bodily movement, but like orchestral music are rich mixtures of more stable bass slow-moving rhythms and more fluid, quick-changing melodies. This also implies that

action occurs over varying timescales – in some cases milliseconds in duration, in others minutes, hours, weeks or longer.

AN OPERATIONALIZATION OF FRANKFURT'S CONCEPTION OF FREE WILL

Peeters, A. (Radboud University Nijmegen, the Netherlands)

Experimental research on the freedom of the will has centered on a Cartesian conception of volition, meaning that 'freely voluntary acts'--in the words of Benjamin Libet [1]--are based on a *conscious* decision making process. Several experiments have shown1 that the role of consciousness in this is highly problematic: unconscious processes seem to play the key role in our actions, while our consciousness is just there, sitting along for the ride. Or in the words of neuroscientist Michael Gazzaniga: our consciousness plays the role of an 'interpreter' of our actions. Because of this it is sometimes concluded that free will does not exist. [2]

In philosophy, a Cartesian conception of the mind has long been supplanted by theories that have evolved beyond the 17th-century, and are more connected to contemporary intuitions on how we act. Why then does Descartes still play such an influential role in empirical research on free will? A possible answer is to assume, for a moment, that a Cartesian conception of the mind is this influential because it is *so easy to test.* This automatically leads to the questions: are other operationalizations of the freedom of the will possible? And what would they look like?

In this paper I will take Harry Frankfurt's conception of free will [3] and propose how it could be operationalized in an experimental design. Contrary to traditional positions in the debate on free will, which focus on the possibility of choice in the face of a deterministic universe. Frankfurt argues that we need a different approach to the problem of free will. He makes a distinction between first order desires, what we want, and our second order volitions, what we want to want. According to Frankfurt, free will exists in the face of the compatibility between our desires and whether we want to have those desires. For example, someone who is addicted to a drug and wants to take that drug, takes it. She however, does not want to want to take it and because of this, does not act freely. The attractiveness in this approach lies in its elegant intuitiveness: we are confronted with such clashes within ourselves on a daily basis Frankfurt's conception of free will is an alternative to the Cartesian approach. My thesis is that the Cartesian paradigm might be relatively easy to test in an experimental setting, but it is not the only way to go. In order to bridge the gap between philosophical theory and scientific operationalization, whether in psychology or cognitive science, I investigate how Frankfurt's ideas could be falsified, or supported, with empirical research. After I have given these possible ways to operationalize Frankfurt, I will make links to current scientific knowledge in two ways.

Firstly, I will present how current research, on addiction for example, supports Frankfurt's ideas. Secondly, I will point out which knowledge we lack to ascertain the validity of his ideas, and what experiments we need to remedy this. With this we

will have a philosophically plausible and scientifically relevant alternative to the Cartesian approach on free will.

 Cf. Libet, B., Gleason, C. A., Wright, E. W., and Pearl, D. K. (1983). Time of conscious intention to act in relation to onset of cerebral activity (readinesspotential). The unconscious initiation of a freely voluntary act. Brain, 106:623-642.
 For example in Wegner D., 2002. The Illusion of Conscious Will. Cambridge, MA: MIT Press.

[3] Frankfurt, H., 1988. The importance of what we care about. Cambridge, UK: Cambridge UP.

THE FIRST PERSON AUTHORITY AND THE DETERMINISM OF THE WILL

Pacholik-Żuromska A. (Department of Epistemology and Cognitive Science, Nicolaus Copernicus University, Poland)

There is no doubt that the assignment of free will to a human agent is an important factor which constitutes the autonomy of the subject. But is it the real freedom or just a sense of freedom, a kind of illusion? Reductionist theories of mind in large part relate to the results of research conducted by the representatives of science, including neurobiologists. One of the results of such studies is to ensure that decisions and will of the subject base on the processes occurring in the brain, and these are determined by internal physical states of the organism and its interaction with the environment. Is this argument enough to preach the determinism of the will? What is known as determinism of the will is in fact merely a relation of cause and effect. An argument based on empirical data referring to the readiness potential increasing in the motor cortex before a subject makes a conscious decision and, therefore, saying that "the decision was made by the brain, not the person", is nothing but a version of the common theories of mind saying that the mental states have their cause in the physical states of the brain i.e. mental states base on the physical states.

The sense of having free will is an important factor in the self-formation. Other speaking making decisions is a cause of the belief about being autonomous subject hence of being a self. However the attitude of willing to do x is secondary towards other mental acts, as for example paying attention, because to identify a decision, an agent needs to concentrate on her particular mental state. Other speaking, not the will itself but the attitude of willing to do x has to be conscious first. This is what I call the phantom of the inner eye. A human agent perceives her mental states in the same way as she perceives objects from the outer world. Of course the relation is not the same because there are intermediaries (sensibilia, representations) between subject and observed outer object, however the difference is important for epistemology but not for psychology. On the level of reflexive consciousness an agent equally perceives the content of perception and perceives that she perceives. The perception of the inner states in this way causes the belief, that an agent is a subject of these states. In the same way the perception of decision making (as a special kind of attitude) causes the belief of being the subject of the decision. On this

ground the agent infers that the decision was his own hence independent and autonomous.

I will argue that:

1. The sense of free will is an effect of an observation one's own actions as done by her. (and of the reasoning: "My body is doing it (my hand moves in the way I will), therefore I am the independent cause of my action").

Therefore

2. The sense of free will is enough to speak about the authority of the first person in her decision making.

But

3. The sense of free will itself is indeed not the free will.

4. There is no such thing as free will, since there is no such thing as a persistent self.

IMITATION, SKILL LEARNING, AND CONCEPTUAL THOUGHT: AN EMBODIED, DEVELOPMENTAL APPROACH

Fridland, E. (Philosophy, Berlin School of Mind and Brain, Germany)

In the search for that special something that might account for the difference between human cognition and the cognition of non-human animals, imitation has received a lot of attention. This is especially true in developmental and social psychology circles where imitation, an arguably unique human capacity, has been deemed crucial to the development of social cognition and higher-order executive function (Tomasello et al. 2005; Tomasello and Rokoczy 2003; Meltzoff 2005). It is thought that imitation fosters in humans the capacity to form tight social bonds, share in joint attention, joint action, linguistic communication, shared intentionality, an understanding of other minds, and finally, an understanding of ourselves. These interpersonal connections are meant to pave the way to full-fledged, florid, higherorder, human-style thinking. The problem remains, however, that it is not at all obvious how imitation alone is going to guide us into these lofty cognitive realms.

In this paper, my goal is to offer a theoretical strategy for moving from imitation to conceptual thought. After accepting that imitation plays a vital role in accounting for the facility with which human beings acquire abilities, I argue that successful task performance is not identical to intelligent action. To move beyond first-order behavioral success, I suggest that the motivation driving imitation, when applied intrapersonally, acts as a parsimonious and powerful force. Specifically, I argue that the orientation that humans have toward the means of intentional actions, i.e., the orientation that drives imitation, also propels us to perfect our skills in a way that produces fertile ground for florid thought. I develop this account by presenting a theory that grounds the flexibility, manipulability, and transferability of mature human cognition in embodied skill.

In the first section of this paper, I argue that in order to develop an adequate account of human imitation, we must take seriously the means-centric orientation. The means-centric orientation, I claim, makes the means of intentional actions salient and interesting for not-merely-instrumental reasons. This orientation gives us

an explanation of the human preoccupation with imitative learning in a way that an account that makes reference to social, cooperative reinforcement alone cannot.

In the second section of this paper, I investigate three characteristic features of intelligence: flexibility, manipulability, and transferability. By relying on Karmiloff-Smith's (1986; 1990; 1992) theory of representational redescription, I argue that imitation alone, though impressive as a strategy by which to gain behavioral mastery, cannot provide us with an account of these three central features of intelligence.

In the final section of this paper, I propose that by inverting the means-centric orientation onto oneself, one can move from the first level of procedural task success to the intermediate stage of cognitive development. I argue that this intermediate stage is one of skill refinement, where a child's goal is to practice and perfect the way or manner in which she instantiates her abilities. Through this process, the first signs of intelligence emerge. This is because as children work on their abilities, they begin to break apart their fixed action patterns into identifiable and reidentifiable action elements, which can then be combined and recombined in various ways and contexts. This process, I claim, is the process through which flexibility, manipulability, and transferability develop.

My hope is to elucidate how skill refinement, underpinned by an inverted means-centric orientation, accounts for the emergence of flexibility, manipulability, and transferability by producing a basic syntax of action. Though more work needs to be done in order to get us to completely abstract, conceptual thought, I take it that this naturalized story of skill refinement and intelligence puts us on a productive path.

THINKING ABOUT THOUGHTS: ADVANCE OR REGRESSION? Stein, S. (Universidade do Vale do Rio dos Sinos, Brazil)

According to Andy Clark (1997), it isn't necessary to eliminate the concepts of computation and representation from research in embodied cognition. If we know the functions of the brain and their place, we can also identify representations, chemical-physical manifestations that participate in cognition and actions. For this we need to think about human beings as part of the evolutionary drift. Clark emphasizes cases like those involving reasoning in the absence or non-existence of states of affairs, as well as abstract reasoning processes that seem not to dispense with the assumption of some kind of representational system. Clark tries to reconcile the representational approach of cognition with the view held by Varela, Thompson and Rosch (1991), who claimed that cognition is embodied action, embedded in biological and cultural contexts. According to them, the world is "dependent on the perceiver," but is not their creation. The perceived world depends on biological and cultural forms shared by co-specifics, that is, depends on evolutionary, historical and cultural constraints.

Clark lists six characteristic elements of a research in embodied cognition: a) Nontrivial Causal Spread; b) Principle of Ecological Assembly; c) Open Channel Perception; d) Information Self-structuring; e) Sensorimotor Experience Perception; f) Dynamic Computational Complementarity (see Shapiro, 2011). Based on recent views about embodied cognition and the analysis of the possible criticisms of computational perspectives in cognitive sciences, complemented by classical approaches in philosophy of language, such as Wittgenstein's criticism of an understanding of language as expression of thoughts, I will discuss the need for a discourse about representations as essential to a full understanding of communication, more specifically, of the meaning we suppose to be present in communication and to be part of what we call representations. Hence, in order to reach a clear view of this debate and simultaneously seek for a solution to it. I think one should ask to what extend Wittgenstein (Philosophical Investigations, [1953]) was right in his analysis of meaning. If meaning is a social phenomenon, and isn't something that can be captured exclusively by an investigation of humans minds, and if, at the same time, it is admitted that following rules is linked to some extent to mental states, then why should we disagree with a theory of communication that seeks to capture meaning partially through an investigation of mental activities? One has, at least, two choices in order to hold a Wittgensteinian view, viz. sustaining that meaning isn't strictly speaking mental: a. Trying to understand the linguistic rules we use when communicating as something related to mental activities, but detached from biological determinations. In this case, one has to explain how a Wittgensteinian social interpretation of meaning leaves room for a rationalistic explanation of beliefs (cf. John McDowell); or b. Overcoming Wittgenstein's logical behaviorism [1] and explaining meaning from a biological point of view. seeing representations as an important part of our rule following (cf. Ruth Millikan). If one takes the latter option, one must say that Wittgenstein's behaviorism was limited in its capacity to explain meaning. This return to a classical discussion in philosophy of language should help us to reevaluate the disagreements between representationalists and theorists of embodied cognition, who see empirical knowledge, communication and action as not dependent on assuming an individual's possession of mental representations.

[1] I will presuppose that one can interpret Wittgenstein as assuming a sort of behaviorist point of view, although perhaps not in a strict sense.

AGENTIAL ASPECTS OF INTROSPECTION

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The upsurge in consciousness studies has triggered a return to an interest in the topic of introspection. The resulting investigations have proceeded in two directions. The first line of research has been followed by those who consider introspection to be an indispensable and valuable method of collecting data from which we are able to infer about conscious experience. Within this approach the main issue is improving introspective techniques, e.g. an appropriate training of subjects in order to increase the reliability of introspection. The second line of research has focused on the very process of introspection. Such a starting point seems to be particularly important, not only because it delivers substantive knowledge about one of the key functions of the mind, but also for the reason, as Feest (2012) aptly pointed out, that the related findings matter to the evidential status of introspective reports for the science of

consciousness. That is, the way we produce such reports determines the scope of inferences we are entitled to make from that data.

By placing the problem within the latter field of scientific studies I want to address questions concerning the agential aspects of introspection. First and foremost, however, some initial constraints should be imposed on the main concept. Hence, what I will mean by introspection here is the process of cognition of one's own current and conscious mental states which results in a judgment or even belief about these states. I assume that this type of mental activity requires some effort and does not, as some hold, occur persistently during consciousness.

It is important to distinguish introspection from the basic form of self-awareness, on the one hand, and from gaining knowledge about one's own dispositional or long-standing states on the other. That is because these different ways of knowing one's own mind engage different cognitive capacities. In many empirical studies the fact in question seems to be generally unrecognized, and consequently, each kind of knowledge about the content of a person's own mind is qualified as introspective self-knowledge.

In this presentation I want to examine to what extent such narrowly conceived introspection includes agency. The simple intuition which lies behind this inquiry has arisen from the observation that introspection is something that not merely happens in our minds, but something that we can bring about and control to a certain degree. Indeed, the fact that introspection is performable on request is widely employed in scientific practice when subjects are asked to report on conscious experiences. Framing the scope of agency in introspection, however, demands that more fine-grained measures be adopted.

Clearly there are many views on the criteria for something to be a mental action (O'Brien, Soteriou, 2010), and many views on the range of mental faculties engaged in introspection. Taking this into account, I argue that there are several important senses in which it can be said to be agential. Such an agential notion, in turn, may have some interesting implications for conceiving introspection as a method of producing scientific data.

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MOTIVATION, VOLITION, AND CONSCIOUSNESS

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In this paper the concept of motivation will be analyzed in an interdisciplinary approach, drawing both from psychological and philosophical sources. Classical philosophical theories of motivation are theories of the will and is relation to propositional content, as it is presented by conscious reasoning processes (Alston 1967, Mele 2005). Motivation is thus construed as a conscious volitional act of

wishing, directed towards propositional content. Anne's wish to exercise for her general health to improve. This constitutes her motivation to engage in physical activity. More precisely: Motivation requires the presence of a relevant desire and a means-end belief. If an agent wants that p, and thinks that performing an action A is a means to achieve that p, then and only then is the person motivated to perform A.

This philosophical concept (often dubbed "Humean motivation) construes motivation as a rational and conscious deliberating process about a given volitional state (Davidson 1980). Motivation thus becomes a very high-level mental state only found in humans. Thus, in philosophy since the times of Plato, drives were distinguished from volitional states in agents. Drives are not intrinsically connected to practical reasoning, they may well be partly pre-conscious. The relevant volitional states in agency, however, were supposed to be directed toward ends presented to reasoning and fully present in consciousness.

Theorizing about motivation in psychology developed in many respects differently. Motivation was initially seen as a drive, which was described as an excitatory state produced by a homeostatic disturbance (Hull). In the tradition of Freud, it neither had to be fully present in the scope of conscious attention, nor was it to be intrinsically related to practical reasoning. According to most contemporary empirical research, both in psychology and the neurosciences, the motivational basis for action is not primarily a conscious volitional act in the context of a means-end deliberation. Philosophical and psychological theories of motivation were thus separated by an unbridgeable conceptual chasm.

In this paper an attempt is made to bridge this gulf. It is argued that psychological self-determination theories of motivation (Ryan/Deci 2000, Kuhl 2010) provide an empirically tested conceptual apparatus that can be fruitfully connected to contemporary philosophical debates on autonomy, agency, and motivation. This is true, however, only for those philosophical approaches that are in crucial respects critical of the Humean tradition sketched above. Harry Frankfurt's theory of autonomy (Frankfurt 1998) and his model of two levels of volitional states will be used to provide an alternative account of motivation.

The key motivating force is the will for selfdetermination or selfrealization. The central psychological and philosophical concept in this theory is the "self". Motivation is seen as vitality or energy available to the self under well defined circumstances of the volitional system. Motivation is not as mere drive or raw will power (Baumeister, Muraven, Tice 2000). Empirical evidence shows that self-controlling regulation by conscious volitional acts depletes vitality and energy, autonomous self-regulation of behavior does not (Ryan/Deci 2008). Based on these findings a philosophical concept of the self will be advanced that is in accordance with some current empirical work (Damasio 2012). More importantly, the theory thus sketched, preserves the classical philosophical notion of the human as a rational agent. Motivational force, however, is not primarily derived from means-end reasoning but from the experience of a selfcontrolling, selfcongruent multi-layered volitional system which incorporates the episodic biographical experience of the self.

DESIRING TO DESIRE

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The question of whether reasons that motivate action must involve desires or other pro-attitudes is a subject of controversy. Yet, most philosophers seem to believe that persons could have second-order desires. Moreover, some philosophers (Frankfurt, Taylor, Korsgaard) even believe that the capacity to have second-order desires distinguishes human persons from other kinds of beings. The term 'second-order desire' usually refers to a desire that the person having it will *herself* desire that *p* or to perform an action X. In addition, Second-order desires seem to involve the conception of them as states that may obtain even if the first-order desires that are their intentional object do not obtain. I will assume without argument that a person having a second-order desire must be *reflectively conscious *of having it and of what she desires to desire.

In this paper I argue that it is not possible to *rationally* *desire to desire* something. I begin by clarifying why the idea that we may have rational second-order desires is naturally imposed on us. I then show why mental states of desiring to desire must entail the existence of the first-order desires that are their objects. I continue by showing why desiring to desire something *cannot be distinguished* from the supposed first-order desires that are their objects. I then respond to several types of objections that can be raised against the position defended here. I end by explaining why the impossibility of rational desires to desire something is compatible with the possibility of desiring not to desire something and by clarifying why the distinction between desiring something and valuing it is not the same as the distinction between first-order desires and second-order desires.

AUTOMATISM OF EVIL – THE ILLUSION OF CONTROL AND (UN)CONSCIOUS MOTIVATION IN JUVENILE DELINQUENTS

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The traditional approach to delinquent behavior assumes that crime is the result of conscious motivation of an action which is – at least to some degree – under the control of the perpetrator. In the light of recent psychological and criminological research this model of explaining crime seems to fail, especially in reference to actions of juvenile delinquents that can hardly be understood, even on the basis of bounded rationality theory. We will present the most important results of the study on motivation of robbers (n = 54, age: 15,3) and the alternative model of explaining juvenile delinquency based on M. J. Apter's reversal theory.

According to M. J. Apter's reversal theory personality is viewed as states - not a set of permanent traits - and hence changeability appears to be its predominant characteristic. Subjective experience of every individual is represented by one of four domains of psychological functioning: (1) means-ends, (2) rules of behaviour, (3) transactions and (4) relationships. Explaining juvenile delinquency we focus on the first one. For means - ends domain the opposing states are telic and paratelic.

When a person in a paratelic state dangerous situations are enhancing the level of arousal, which is experienced as a rise of pleasant excitement. In case of certain juvenile street robbers the offence committed appears to be one of the ways in which they enhance or maintain a pleasant state of excitement by creating risk situations that are – at least in their own opinion – possible to be controlled. But they have only the illusion of control. A sudden reversal in strongly aroused individuals in paratelic state may result in shift into telic state and bring about anxiety. An emotional state of a person whose arousal is interpreted as a strongly felt anxiety may be described by the metaphor of a double-sided coat. If on the inside there is strong anxiety, on the outside it will take an expression of aggression. In other words, in strongly aroused individuals who are "switched" into telic state there is a strong likelihood of aggressive behaviour, but they are not conscious of the motives of it.

The results obtained in the study analysed in the light of the Apter's theory suggest that delinquent behavior has two basic forms. It can be (1) a controlled operation which is the result of conscious and rational decision making process as the traditonal approaches maintain or (2) an impulsive, irrational action that can easily get out of control and whose motive the agent is not conscious, what can be understood on the ground of the reversal theory. Our model, supported by evolutionary theory and neurobiology, explains the conditions of this two basic forms of delinquent actions.

VIRTUALIST REPRESENTATION AND THE COMPOSITION OF PRESENCE

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The sense of presence is starting to become a central idea in several areas of cognitive science, such as, human computer interaction and the philosophy of mind and consciousness. Investigations of presence have arguably begun to a unitary concept across these disciplines, and it is now taken to be a central form of content of consciousness, perhaps even be central to the constitution of our conscious mental lives as such. This paper examines the nature of presence and explores the idea that it may be a central component or enabling condition in human mental representation. To this end it develops a virtualist theory of mental representation which turns on four broad principles.

1: the presence of an agentive self within an enveloping world appears to be the basic and default configuration of mental representational space. Representation on this model is not figured as a sort of internal mirroring of the world, nor composed of mentalese components, but is a structured perspectival fusion of the agent spatially centred in a world.

2: minds like ours present as a default configuration a complex and holistically structured perceptual fusion with multi-dimensional contents. This comes as a transparent perceptual totality, the distinct dimensions from which it is formed generally only apparent in breakdown. This perceptual gestalt is – under normal conditions – configured to produce a spatial / perspectival fusion which gives a

sense of presence. This perceptual world exists as a base level as a structured complex and cannot be reduced to atoms, either as qualia or molecules such as propositional attitudes. The world is basically apprehended by our minds as a holistic perceptual gestalt.

3: the composition of the perceptual scene is expectational: a continually produced, temporally extended process grounded in perceptual expectations. While sensory contact, is the anchor that constrains projected presence it does not in itself give a perceptual world. According to this virtualist notion of perception, what we perceive is not what is currently in our sensory channels but what sub-personal systems project, based on the most coherent gestalt structure they can produce. The basis of the projection are expectations about the content of sensory channels which can be partially understood along Bayesian lines. The perceptual scene is composed by the cognitive system's attempts to forge an overall coherent structure based on certain presuppositions about the body and its spatial configuration.

4: the perceptual gestalt is virtualist, continually positing an experienced global totality even when the agent is sensorially impoverished. The mechanisms that produce the conscious side of mental representation (or if you prefer, presentation) always are aiming to fuse a complex and partially transparent structured gestalt. While the perceptual totality is generally constrained and generated around a dynamic sensory, or sensorimotor core, overall coherence is just as important a factor in the composition of the perceptual world. In fact the perceptual world cannot be straightforwardly decomposed into the occurent deployment of sensorimotor expectations (e.g. as Noë argues) as these continue to be actualized even when sensory contact is attenuated. Thus, an overall coherent scene continues to be projected even in cases where sensory contact radically under-specifies the given perceptual world as in cases of dreaming, hallucination and Anton's syndrome. The perceptual system strives to produce, but does not always achieve, the highest state of global coherence.

Mental representation on this analysis is centred around (1) presence; is given as a (2) holistic gestalt, which is produced by (3) actualizing expectations, composed by the (4) virtualist positing of overall coherence. Mental representation always tends toward the fusion of the most coherent overall total gestalt based around a subject centred world.

REMARKS ON THE EVOLUTION OF STRUCTURAL KNOWLEDGE REPRESENTATIONS IN ARTIFICIAL INTELLIGENCE

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Representing knowledge is one of the main challenges in Artificial Intelligence. A specific knowledge representation method is a symbolic system that allows to capture, represent and process human beliefs concerning a specific subject, or task in a given domain of interest.

Most of the commonly used knowledge representation methods have a welldefined logical interpretation. However, this is not the only aspect that matters. What is important from the practical point of view is their semantics and expressiveness. A practically usable knowledge representation formalism should also be processable in an algorithmic manner. Combining all of these issues is not trivial, especially because the more expressive a method is, the harder it is for processing from the computational point of view.

In last decades number of methods for knowledge representation and processing were developed. The ones directly based on the first order predicate calculus include logic programming and production rules systems.

Gradually a conceptual modelling of knowledge became important. Therefore structural representations started to play a more important role, including frame systems, conceptual graphs and semantic networks.

Until recently they did not get a wider adoption outside of the AI community. This was due to the fact, that their limitations with respect to simple logical interpretation and machine processability did not allow for practical computer tool development. This situation changed with the introduction of formal ontologies described with the use of the family of description logics. Currently these are being combined with the previously proposed rule representations.

The paper discusses the evolution of the above mentioned methods of knowledge representation and processing. It is argued, that the key factor behind their evolution was not only their logical formulation, but also their visual interpretation. Today, the search of new knowledge representation and conceptualization methods is also driven by approaches having their roots in cognitive science, such as mind maps. Such methods find their application not only in the Artificial Intelligence modelling, but also in computer science. Moreover, applied knowledge engineering is often concerned not only with the knowledge capturing and modelling but also with delivering methods simplifying the communication of human analysts.

So while, knowledge representation methods were originally developed mostly to support man-machine communication, these days they are also used to drive manto-man communication supported by machines.

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VARIETIES OF PERCEPTUAL CONSCIOUSNESS

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It seems that a constitutive part of any perceptual act is its experiential aspect. Perceptual experience may be identified either by reference to what Thomas Nagel calls "what is it like" to be a given subject, or by invoking the awareness of phenomenal qualities, that is qualia, for example colors, smells, and sounds. The question arises: what kind of consciousness is involved in perceptual acts? Although the state of "what is it like" and the qualia awareness have many features in common, there is an important difference between them. That is to say, the notion of quale seems to presuppose the notion of consciousness in the Negelian sense, and not *vice versa*. The reason is that one may argue that "what is it like" state does not require experience of any sensations whatsoever: it is conceivable that someone may be in a state of being oneself through directing one's consciousness onto one's own thoughts. However, it is hardly acceptable that someone may be aware of the smell of magnolia, without being in the Negelian "what is it like" state. Hence qualia awareness requires a wider competence than undergoing "what is it like" state. As some thinkers describe it (P. Carruthers, D. Rosenthal) qualia awareness presupposes higher-order consciousness. And the latter may be further conceived either as a kind of experience (higher-order experience), or a kind of thought (higher-order thought).

It is apparently evident that the notion of perception has to involve qualia awareness, since what, if not the first-person phenomenal experience, determines that someone feels something, sees something, or hear something. However, it should be noted that perceptual experience is today often understood as a kind of knowledge how, and thus not as qualia awareness, but rather as the ability of proper response to various stimulations coming from the environment. Advocates of this view claim even outright not that qualia do not exist, but that they are dispensable in the description of perceptual experience. Perception and experience should be portraved rather in terms of sensorimotor knowledge (A. Noë, K. O'Regan, S. Hurley, E. Thompson). Be that as it may, the relationship between gualia awareness and sensorimotor knowledge has to be established. For example, persons suffering from blindsight are able to exercise sensorimotor knowledge, while lacking visual qualia. That is to say, in their phenomenal perceptual field the object, which they can easily get hold of, is not present. This might suggest the independence of qualia involving information processing mechanisms from sensorimor information processing mechanisms. Sensorimotor information might be processed on the subpersonal level (and that would constitute an explanation of why persons with blindsight are capable to perform spatial tasks properly), and strong evidence could be adduced in favor of the view that information about qualia might be processed on personal level.

MECHANISMS, NATURAL KINDS, AND CONSCIOUSNESS Huber, T.

The guiding hypothesis of this paper will be the following: An adequate description of a given cognitive or psychological phenomenon requires scientifically valid applications of the concepts and methods to the phenomenon under investigation. The concepts and methods employed prevent progressive scientific research when they fail to discriminate and specify the target phenomenon adequately.

In this paper, I will examine the heuristic function and epistemic justification of the concept of "phenomenal consciousness". In his *Explaining the Brain. Mechanisms and the Unity of Neuroscience* (Oxford University Press: 2007), Carl Craver provides a set of criteria to evaluate scientific identifications of the

explanandum phenomenon in question. Craver describes three ways of how scientific explanations can fail: *underspecification*, *taxonomical error*, and *misidentification* (Craver: 124-128).

Taxonomical errors occur, for example, when it is assumed that distinct phenomena are one, or, conversely, when it is incorrectly posited that one phenomenon is many. The failure to account for the multifaceted character of the phenomena results in leaving the phenomena underspecified, so that it becomes difficult for different research groups to agree upon the definition of the phenomenon under investigation. In case of misidentifications, the phenomenon cannot be explained because it simply does not exist. These failures of description in scientific practice provide normative criteria to assess the explanatory success of explanations.

In the first part of the paper I will apply these criteria to the phenomenon of consciousness in order to explore whether "consciousness" is a useful scientific concept. The second part of the paper will investigate the question whether the concepts of "phenomenal consciousness" or "consciousness" – that are partially employed in folks-psychology and in scientific practice – pick out natural kinds; or whether they constitute an artificial class of theoretical concepts without a heurist role for the development of scientifically and philosophically relevant theories. In short, I will argue that "consciousness" is not a natural kind that can be identified by looking for clusters of commonly co-occurring properties that are generated by a common mechanism. The argument that consciousness fails to pick out a natural or scientific kind will support a scientific eliminativism about consciousness.

LOOKING FOR EMOTIONS IN THE BRAIN

Shargel, D. (City University of New York, the Graduate Center)

Many philosophers who are interested in neuroscience can list where various types of mental states are supposed to be located in the brain. With regard to emotions, they are likely to mention the amygdala, and perhaps the orbitofrontal cortex (OFC), anterior cingulate cortex or insula. If they saw a study which showed that activation in these areas was correlated with, e.g. moral judgements or pain, many would consider that to be good evidence that emotions were connected with those mental states.

I will argue that this sort of inference demonstrates a misunderstanding of what we know about emotions and the brain. We have good evidence that certain brain areas are active during emotional episodes, and that damage to these areas disrupts normal emotional responses. However, this does not by itself determine whether emotions are actually located in these brain regions, or whether other mental processes which are crucial for these responses are located there.

I will focus on the amygdala and the OFC. With regard to the OFC, I will argue that researchers have failed to distinguish emotions from volitions. It is difficult to tease apart volitions and emotions, since they both play a role in motivating behavior. In addition, the satisfaction or frustration of volitions often elicits emotions, and occurrent emotions often strengthen or weaken volitions, so both types of states will often be active during the same episodes. I will present a very

simple model of how emotions relate to volitions and apply that model to research on the OFC. I conclude that the OFC is a good candidate for the neural location of volitions. Emotions may be located there as well, but we currently lack any compelling reason to think so.

The research on the role of the amygdala raises a different set of issues. It is clear that the amygdala produces some of the bodily changes associated with emotions. However, there is an ongoing philosophical debate about how emotions relate to these bodily changes. The traditional view is that emotions cause these changes, but followers of William James such as Antonio Damasio and Jesse Prinz argue that the bodily changes precede emotions. A third view, which was championed by Karl Lange, identifies emotions with the bodily changes themselves. Depending on where you stand in this debate, evidence that the amygdala causes these bodily changes will lead you to a wide range of different conclusions. As a result, we must settle this debate before we can determine whether to locate emotions in the amygdala.

SUPERCOMPATIBILISM AND FREE WILL

Kirkeby-Hinrup, A. (Philosophy, University of Lund, Sweden)

There is a fact of the matter about the nature of the human will and whether it can be considered 'free'. To investigate this fact is attempting to answer what can be termed the metaphysical question of free will (M-question). The M-question is not identical to the problem of free will.

'The problem of free will' is often presented as one of two distinct problems (or sometimes a combination of them). The first problem is whether free will is possible given determinism or indeterminism (D/I-issue). The second problem is whether free will is necessary for responsibility and morals (R/M-issue). I argue that in providing an answer to the M-question, one should disregard both of these problems. The two 'problems of free will' need not- and should not- yield any influence on the answer to the M-question. The normative claim, 'that they should not' is based on considerations of prudence recommending that care should be taken to avoid introducing elements that create arbitrary biases on subjects with which they may have no necessary connection.

Traditionally theories of free will have taken either determinism or indeterminism as a precondition. However, we can do without a definite answer to the D/I-issue, if the answer provided to the M-question needs no precondition. This would make it compatible in a certain overarching way i.e. 'supercompatible'. Do not confuse this idea with compatibilism (theories that claim free will is specifically compatible with determinism). Rather supercompatibilism is a constraint, not a theory. Supercompatibilism is the doctrine that theories of free will should be *broadly* compatible with regard to the D/I-issue. Broad compatibility thus entails a threshold to the severity of the consequences any definite answer to the D/I-issue can have. A strong supercompatibilist accepts *no* consequences, and thus set the threshold at zero. In contrast, a weak supercompatibilist will have a higher threshold. She can accept that different outcomes of the D/I-issue prompt changes in her theory, as long as those changes are non-critical. Naturally one cannot be a

supercompatibilist if any outcome on the D/I-issue makes one's theory unfeasible. Prudency recommends supercompatibilism because presently the relation between either determinism or indeterminism and the M-question can at best be contingent. It can at best be contingent because either of the theses may eventually be discovered to be false. Since the matter is scientifically and theoretically unsettled, taking any outcome of the D/I-issue as a precondition will be the result of arbitrary convictions and preferences of the theorizer. I submit that the most prudent way to deal with this contingency is adopting supercompatibilism.

Like with the D/I-issue, prudency recommends keeping the R/M-issue apart from the M-question. This prudency is based on asymmetrical influence between the R/M-issue and the M-question. It is possible to both pose and answer the question "do humans have any sort of free will?" without any reference to the R/M-issue. Therefore the answer to the M-question must be essentially independent of any conclusions regarding the R/M-issue. So, since the M-question is independent of whatever is the case on the R/M-issue, this cannot be allowed to influence the Mquestion. The independency the M-question from the R/M-issue is often overlooked, one reason for which might be because the reverse is not obviously the case. At least some theories on the R/M-issue could be affected by some answers to the Mquestion, but this is irrelevant to work on the M-question. What matters is that no theories from the R/M-issue can influence the answer to the M-question therefore the prudent scientist should avoid mention of the former from discussion of the latter.

IN THE WONDERLAND OF CONSCIOUS WILL

Galikova, S. (Institute of Philosophy, Slovak Academy of Sciences)

In everyday experience we intuitively feel that our intentions and decisions play an important role in action and overall behaviour. We feel that we cause ourselves to behave. So, it seems that we consciously will our voluntary actions. Experimental research and clinical practise however, bring evidence of fundamental flaws in the way people perceive themselves from the "inside" (from the first person).

Experience of consciously willing an action is not a direct indication that the conscious thought has caused the action. Moreover, there are no plausible arguments demonstrating that the nature of conscious states is *mental* as opposite to physical. These claims are supported by strong evidence from experimental research (Tversky, Kahneman) and clinical practise (Sacks, Damasio). Nevertheless, some philosophers of mind (Searle, Chalmers) have great difficulties in accepting the implications of novel scientific findings concerning the nature of consciousness and will.

The aim of my presentation is to propose a way of reconciling our inner feelings of causal agency and the scientific explanation of behaviour in terms of underlying processes. My strategy is based on rethinking the traditional picture of a man as a rational free agent. I intend to reconsider two aspects of confusions due to considering free actions as: a) conscious actions and b) mental causes of actions. I will also examine separation of action from the experience of will in the following: 1. feeling conscious will in action we did not anticipate (confabulation of intentions) absence of feeling conscious will in anticipated action ("alien-hand syndrome"),
 unconsciously caused action (automatisms, cognitive dissonance). Experimental findings in cognitive psychology demonstrate as fundamental the *timing* problem in the supposed mental causality chain (Gray).

Scholars assume that experience of conscious voluntary action can occur: a) in advance of the action (priority principle), b) just after the action (rapid action), c) during the action (principle of consistency). Several experiments bring evidence for the delay of conscious states in a variety of modalities (motor action, language, thought). Automatic neuronal processes precede (reported) conscious awareness of the stimulus (Libet, Wegner). I argue that from experiencing the seemingly distinct nature of our inner conscious states do not follow any interesting ontological commitments. The appearance/reality distinction works both for the "outside" physical world and the seemingly distinct "inner" mental world. The experienced asymmetry between our inner feelings (appearances) and a natural explanation of action (reality) has become an *explanandum* itself. It is a fatal mistake to identify a priori our experience of acting freely with an occurence of mental, conscious causes. Understanding consciousness and will in physical terms does not deprive men from freedom and responsibility. On the contrary, Only then we are able to admit both in theory and practise that consciousness fits perfectly into the physical world and therefore really matters.

VOLITION AS A NECESSARY COMPONENT OF ANY POSSIBLE SOLUTION FOR THE MIND-BODY PROBLEM

Krasowski-Sławosz A. (Jagiellonian University, Poland)

In my presentation I would like to focus on the role of volition for looking for the solutions of the mind-body problem. I will argue that volition, together with emotions and qualia, will be necessary for any relevant model of the mind that could be a candidate for a solution for the mind-body problem. Alternative concepts that try to neglect volition or diminish its role, despite being claimed to have strong confirmation, have serious flaws, which can be generally described as trying to get rid of what is just inconvenient for their models.

Things like consciousness and the voluntary influence for our actions are usually taken for granted by general public, but nevertheless they are often taken as illusory in contemporary philosophy and cognitive science. However, little is explained why we would have such illusions – if consciousness was an illusion, or if volition was just a epiphenomenon, we should have a good explanation why it intuitively does not seem that they are.

At present we have no reasons to hold that the controversy whether mind is autonomic and whether volition has causal influence, or not, is definitely solved. We can choose one or other of the options – and as I am going to argue, we have good reasons to at least look at the first one. Therefore I assume that in order to deal with the mind-body problem we will have to deal with the problem of subjectivity and with the problem of its causal influence.

My considerations will be developed in the light of contemporary quantum mechanics approaches to consciousness in which the commonly held thesis of causal

closure of the physical not only is unnecessary, but also can be considered as impossible. It is going to include debates concerning such issues as reduction of the wavefunction, problem of decoherence, nonlocality and backward in time referral. In the last part of my presentation I will concentrate on some empirical arguments showing that models of mind which include volition as one of the key points of consciousness will have serious advantages over those that focus on other things like computations, working on representations, or taking it more classically, just on thinking.

In my presentation I will mainly refer to Chalmers's and Nagel's understandings of what the mind-body problem is, and to Stapp's and Hameroff&Penrose's attempts to solve it. The main point in this debate is that while we can discuss a lot about the material component of the mind-body problem, we know little about its mental component. The problem how exactly that component could look like will be left for further discussions; the key point for the presentation will be to say that whatever the future model of consciousness will be, it will have to include volition as one of its fundamental components.

THE ROLE OF INTENTIONAL ACTION IN SELF-DECEPTION Lynch, K. (Philosophy, Warwick University, United Kingdom)

The self-deception debate often appears to be polarized between those who think that self-deceivers intentionally deceive themselves ('intentionalists'), and those who deny this ('non-intentionalists'). It is commonly taken that non-intentionalists are committed to the idea that intentional actions don't have a significant role to play in the explanation of the self-deceptive belief at all, and that certain non-rational cognitive mechanisms are responsible for this unwarranted belief. However, the supposition that the unwarranted belief forms as the result of the person's actions (including mental actions), actions which are intentional, and motivated by the desire that p, may be consistent with non-intentionalism, so long as the intention with which these actions are done is not an intention to deceive oneself (this was all the non-intentionalist was concerned to deny!). In this paper I am interested in developing such a version of non-intentionalism, which I call an 'agentive non-intentionalist' position.

According to this, self-deceivers do end up self-deceived as a result of their own intentional actions, but where the intention these actions are done with isn't an intention to deceive oneself. Certain empirical studies are consulted to identify the intentional actions involved in generating self-deceptive beliefs. I conclude from these that people deceive themselves by acting in a hypercritical way towards the unwelcome evidence they encounter, while neglecting to subject welcome evidence to appropriate scrutiny. A 'non-intentionalist' interpretation of the intentions associated with these actions is then developed and defended, which states that self-deceivers act with the intention of finding any evidence which would confirm the proposition they wish to be true. This view is defended against the possible objection that it too leads to paradox just as with the idea of intending to deceive oneself. This account thus keeps agency at the heart of self-deception while also avoiding the paradox associated with other agency-centered views.

CONSCIOUSNESS AND INTENTIONALITY: TROUBLES WITH INSEPARATISM

Arias Dominguez, A. (Filosofía IV, Universidad Complutense de Madrid, Spain)

Recently, Horgan and Tienson (v. g. 2002) have propounded a label and a theory regarding the relationships between intentionality and phenomenal consciousness: *inseparatism*, a thesis according to which there is no intentionality without phenomenal consciousness. Although recent, this is a name for an approach in the philosophy of mind and the cognitive science that we can trace in classic works in the field, as in Searles Connection Principle (1989, 1990, 1992) or Strawsons *noproblem thesis* (vid. Strawson 1994/2010: 177). Inseparatism is an heterodox perspective: over the last decades the usual practice in cognitive science and philosophy of mind has been to treat intentionality and phenomenal consciousness as ontologically and methodologically distinguishable and independent. However, despite the refreshing feeling and the opening of new horizons that every new perspective produces, with them is not enough: inseparatist proposals face a number of problems. We enumerate and analyze some of them in our speech.

These problems include the following:

1. *No-testable assumptions*. In few words, there is no way to check if an organism has only intentional features or, at the same time, phenomenal features too.

2. *Rigid boundaries*. Since intentionality and phenomenal consciousness are supposed to be the marks of the mental, inseparatist theses lead to a dualistic conception of reality where everything apart from conscious organisms is just blind mechanical stuff, and according to which we have to wait –into the phylogenetic scale– for complex conscious organisms to begin to make legitimate mental attributions. Inseparatism, we argue, entails an all-or-nothing dichotomy between complex conscious organisms, on the one hand, and an entirely blind, objective world, on the other hand. In commenting this problem, we offer, from a naturalistic perspective, reasons to doubt that the pursuit for strict criteria to define mental events radically distinguishing it from its evolutionary precursors is intended to be a successful search. This brings us to the last problem.

3. Sudden emergency or panpsychism. Inseparatism leads too to sudden emergency of every mental phenomenon or panpsychist theses. Briefly, if every defining feature of the mental qua mental has to come together, the mental is to emerge suddenly and with no precedent from the physical or be inherent in it. We confront a catastrophist (or cuviertist) comprehension of the emergency of the mental with a continuist (or Darwinian) view and defend the latter.

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ARE WEAK-WILLED ACTIONS FREE AND INTENTIONAL?

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Weak-willed (or acratic) actions can be defined as a phenomenon of acting (at least to some extent) freely and intentionally against one's better judgment. A well-known example of *akrasia* is procrastination – a situation when an agent replaces high priority tasks with low-priority actions, therefore, choosing a course that she would avoid if she could choose it from a different vantage point, either from some time in advance or in retrospect.

In this paper, the authors will discuss theories that try to explain the phenomenon of weak-willed actions, by focusing on the idea of hyperbolic discounting. It is suggested that if an agent follows a hyperbolic discount curve, it can explain how it is possible that she may act impulsively on the spur of the moment – not intending it before and regretting afterwards. It will be further discussed how this observation may work against the idea of weak-willed actions as free and intentional with a possible consequence that an agent should not be held responsible for any impulsive actions.

The authors will discuss a possible solution to this problem which suggests that we should treat a person as temporally different agents: the present one, who does not intend to act in a certain way, and the future one, who intends to act that way if only given the opportunity. This solution claims that a person can always avoid appetites if she knows they are difficult to resist. Arguments against this solution will be given, i.e. 1) we cannot know that we are prone to something before an opportunity is given to experience this proneness; 2) even if such proneness is predictable for an agent, occurrence of these appetites sometimes is not. Finally, another idea will be discussed - one that claims that perceiving a weak-willed action as free and intentional may be just an illusion.

RELATIONS BETWEEN FUNCTIONAL AND STRUCTURAL PARAMETERS OF INNER SPEECH

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Inner speech is the phenomenon of consciously experiencing that one is talking silently to oneself.

According to some reports, it is something that might occupy an average of 75% of our conscious life – with significant interindividual differences (Heavey and Hurlburt, 2008). Yet little is still known about its nature and function. Part of the problem is methodological: it is a private phenomenon that is difficult to access. Yet another part is conceptual: it is not clear whether it is analogous to overt speech

through and through, or it is a special use of it with some idiosyncratic features, or it is even an entirely different kind of linguistic phenomenon. In this paper we intend to address both kinds of problems.

First, we will present preliminary work on a questionnaire for inner speech that we are developing. Questionnaires are one of the tools employed to tap properties of inner speech as reported by subjects (Hardy et al, 2004; McCarthy-Jones and Fernyhough, 2011). Even though they have some methodological shortcomings (Guerrero, 2005), they can provide valuable data that is not possible to gather by other means. The questionnaire that we are testing looks for possible correlations between specific functions that inner speech may serve and the form that inner speech may take. To this end, we distinguish between five possible different functions of inner speech: selfevaluation, evaluation of actions, on-line action control, rehearsal of linguistic actions, and rehearsal of non-linguistic actions. Then we cross them with five different parameters that may characterize the production of inner speech: whole sentences vs. fragmentary speech; idiosyncratic vs. normal speech; first vs. second vs. third person use; imperative vs. indicative vs. other moods; dialogical vs. non-dialogical form. There is previous work that taps the different functions we include, and work that studies the different parameters in different conditions (Morin, 2005; Langdon et al, 2009; Wallace et al, 2009). Yet to our knowledge there is not yet systematic research directed to uncover possible patterns of relation between structure and function of inner speech. So our questionnaire is just a first step in that direction.

Second, partly based on an analysis of our preliminary data, we will revise some current approaches to inner speech. Previous views have typically regarded it as an undiversified phenomenon that, perhaps apart from a few phonemic details (Oppenheim and Dell, 2008; Corley *et al*, 2011), has the same basic format across different situations. Yet there are at least two aspects that may affect the quality of inner speech: one is the type of function that it is performing, e.g., control or evaluation; the other is the part of the cognitive system with which it is interacting, e.g., a verbal system or a non-verbal one. This has further consequences for the views on the conscious mind that one may want to hold.

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COULD A PERFORMANCE INFLUENCE SUBJECTIVE AVAILABILITY OF STIMULI?

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Different measures of consciousness often yield different conclusions about the extent to which awareness relates to performance. Following theories of embodied mind, awareness may be influenced by the execution of responses in the performance tests. We aimed to investigate this hypothesis and compare the relations between the awareness and performance with four different subjective measures of availability in the context of a simple discrimination task (SDT).

In each trial of SDT, participants (N=151) were asked to discriminate whether a male or a female face was presented and then to express their awareness by means of one of four different scales: (1) confidence rating (CR), (2) post-decision wagering (PDW), (3) feeling of warmth (FOW) and (4) perceptual awareness scale (PAS). The presentation time in SDT followed the psychophysical method of limits. To estimate the influence of SDT reactions on subjective availability, awareness ratings were collected either after or before the decisions (the order factor).

All scales were found to be sensitive to awareness, i.e. discrimination accuracy correlated with awareness ratings. However, for every scale the correlations were stronger for ratings that were made after the decision. Furthermore, the accuracy for the lowest ratings differed between the scales for longer presentation times.

We discuss the differences between the scales ratings and the influence of the order factor in the framework of graded access account, comparing the results with our previous findings on awareness measures in a memory task.

A COMPUTATIONAL MODEL OF OSCILLATORY MECHANISMS UNDERLYING INDIVIDUAL DIFFERENCES IN WORKING MEMORY

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Working memory (WM) is a neurocognitive mechanism responsible for the active maintenance of a few chunks of crucial information for the purpose of the current goal/task/operation. These chunks more or less constitute the contents of our consciousness, if we abstract away from phenomenal, perceptual consciousness (i.e., they represent what our attention is internally focused on). Four items on average can be actively maintained in WM, varying in people from two to six items: the exact number defines individual WM capacity. However, why must such a conscious access to information be so limited?

In answering that question, existing formal models of WM assume that the active maintenance relies on the brain oscillatory mechanism tied to theta and gamma bands. As our brains use temporal coding for separating mental representations, and time is a limited resource, brains are not able to pack too many oscillations into one interval, because they start to overlap and the representations encoded by them stop being distinctive. However, as WM capacity is so crucial for higher cognition (e.g., it determines intelligence, creativity, novel problem solving, and many other cognitive abilities), it is surprising that more capacious brains could not have evolved. The existing models do not explain that fact, neither they explain why all people cannot poses the maximum capacity and have to differ in this regard.

We present a novel neurocomputational oscillatory model of WM and we show which its features determine individual differences in capacity. Our model assumes that maintained representations are separated by asynchronous oscillations, while elements of one representation are bound by synchrony. The new proposal consists of one simple equation that controls oscillations. Asynchrony is supported by lateral inhibition among representations, while synchrony can be boosted by their extra coactivation. The former mechanism reflects the level of inhibitory control within the scope of attention presumably located in the parietal cortex, while the latter mechanisms represents the extra activation flowing to the focus from the prefrontal cortex. The highest capacity of the model is reached when the internal inhibition is very low. Increasing the inhibition level decreases the capacity to minimum values, however the extra coactivation can to some extent counteract that decrease. We test our model by simulating the distribution of capacity estimates ranging from one to six memory items, observed in a sample of more than 200 participants who fulfilled a memory recognition task, requiring them to actively maintain a few chunks of information for several seconds. The model also simulates a number of other experimental effects, including that it explains how changes in memory load and inhibition can lead to both shortening of the gamma cycle and prolonging of the theta cycle in high-capacity subjects, in comparison to low-capacity ones.

We also show that the capacity of consciousness is related not only to the ability of active maintenance of information, but also to the ability to discover new relations in environment. Summing up, our model constitutes the original and plausible theoretical proposal explaining why the capacity bottleneck in the conscious access to internal representations must exist and what its properties are.

REFLECTIONS ON CONSCIOUS WILL AND VOLUNTARY CONTROL, WITH REFERENCE TO THE EXPERIMENTS OF B. LIBET

Bremer, J. (Jagiellonian University, Poland)

The experience of conscious will and voluntary control is the principal feature of our human self-understanding, and of our sense of our own authorship of the decisions and acts we undertake. Nevertheless, the commonsense idea that our purposeful intentions are the direct causal triggers of our voluntary actions has been challenged by various research findings. First of all, Benjamin Libet's well-known experiments have inflamed anew the interdisciplinary debate about the foundations of conscious mental processes. This debate touches on areas of human affairs that possess considerable importance for us both at an intimately personal and at a social level – as is most clearly the case with the issue of freedom of the will.

So what does Libet mean by 'the will', or by 'willed actions'? He defines an act as being voluntary when (a) it arises endogenously, rather than in direct response to an external stimulus or cue, (b) there are no externally imposed restrictions or compulsions that directly or immediately control subjects' initiation and performance of the act, and (c) subjects feel introspectively that they are performing the act on their own initiative and that they are free to start or not to start the act as they wish (Libet, 1985, p. 529-530).

Libet himself starts out from what we may call his primary assumption, which is that "We do not hold people responsible for actions performed unconsciously, without the possibility of conscious control" (Libet, 1999, p. 52). Actions that are not consciously triggered are not free. Persons who could neither consciously initiate nor veto their own actions would be similar to those who have lost the ability to block their impulses. (Libet cites sufferers from Tourette's Syndrome here, as an example). Libet's experiments – proving, it seems, that we only become aware of having an intention to act after our brain has already unconsciously shaped it – have been loosely deployed to demonstrate that there is no such thing as free will. At the same time, they have been taken further (e.g. by P. Haggard and M. Eimer, 1999), and his abovementioned primary assumption has also been discussed at length by both philosophers (e.g. D. Dennett, 2003; D.M. Rosenthal, 2002, 2008) and scientists (e.g. W. Prinz, 1996; H.P. Stapp, 2011).

The present paper is dedicated, in essence, to finding an answer to the question of what the processes are that engender our conscious experiences of authorship and voluntary control. In seeking to answer this question we shall concentrate on the cognitive characteristics of voluntary action, understood in general terms, and on the role of effect anticipation in action control, construed in a more specialized sense (see D.M. Wegner, 2002, 2004; W. Kunde, K. Elsner, 2007). How do we come to be in possession of capacities for controlled action?

It will then be demonstrated that willed actions are influenced by effect anticipations, both when they are conscious and when they remain inaccessible to the conscious mind. The question of what effect unconscious effect anticipations have on our control of freely chosen actions will be discussed with reference to our understanding of the role of conscious intention within voluntary action. Pursuing this central point is meant to serve as an alternative to a narrower and more exclusive focus on just the particular processes involved in engendering the experience of voluntary control. We shall then move on to a discussion of Wegner's theory of seemingly mental causation, against the background of the assumption that effect anticipations influence both the actual control of action and the experience of having that control.

GRASPING THE HORNS OF THE NEURAL CORRELATES OF CONSCIOUSNESS: A CRITERION FOR CONSCIOUSNESS THAT IS DISSOCIABLE FROM REPORT.

Foley, R. (Philosophy, University College Dublin, Ireland)

The scientific study of consciousness is reliant on subjective report to indicate whether a subject is conscious of an object. I consider several criticisms of the reportability criterion of consciousness (RCC) and Dretske's (1998) alternative: "the intentional option". I argue that the intentional option does not offer any practical improvements on the RCC, when applied to the scientific study of consciousness, since it offers no way to operationalize consciousness over and above those offered by the reportability criterion. Instead, I propose an objectively testable yet intuitively supported criterion for the attribution of consciousness of an object to a subject on the basis of a specific type of complex, non-automatic, flexible action.

Exclusion tasks (Jacoby et al., 1989; Kentridge et al., 2004; Persaud and Cowey 2008) provide a means of testing how perceiving something with or without awareness affects the performance of the subject. Exclusion tasks are taken to show that there is a qualitative difference between the subject's capacities when aware of and unaware of an object. For example, in word completion tasks (E.g., Debner and Jacoby, 1994) when primed with a word that they have perceived without awareness (e.g., book), subjects will complete a cue (such as b_ _ k) with the primed word, even if instructed not to complete the cue with the word they have been primed with. When subjects report having been aware of the primed word they have no problem completing the cue with a different word (bank, back, balk, etc.).

The reasoning behind exclusion tasks is important as it suggests an unanalysed intuitive assumption in perception studies and in the scientific study of consciousness. The assumption is that whether a subject is aware of an object or not effects how they can interact with that object. This intuitive notion is difficult to distinguish in light of implicit perception studies, but it can be analysed as:

C1: If a subject can use information about an object to guide their behaviour in an object appropriate and flexible fashion, then they are conscious of that object.

For example, in the word completion task the subjects' use of the information is object appropriate, since the information about the prime is treated as a word / piece of semantic content. But, it is not flexible since they cannot use the information to perform the exclusion task correctly. This is an operationalizable criterion for consciousness of an object that has intuitive appeal since it maps onto a common intuition about what it means to be conscious.

I propose that C1 might be dissociable from the reportability: that a subject

might be able to perform certain tasks that meet C1 and yet still not report having seen the object. This is not the case in the examples of exclusion tasks listed above, but I would suggest that this is because they either involve language or other symbolic content (such as arrows) or rely on the capacity to direct attention. Finally, I propose an experiment to test for the dissociability of C1 from reportability. I conclude that if these capacities can be dissociated from report, then we have a new, intuitively supported, objective way of testing for consciousness of an object; and if they cannot, then we have evidence that report is a better indicator of consciousness of an object than many currently believe it to be.

VOLITION AND THE VOLUNTARY-INVOLUNTARY DISTINCTION Czarnecki, B. (Institute of Philosophy, Jagiellonian University, Poland)

The term "volition" is a technical term with a wide range of applications across various disciplines of cognitive science. It has been most vigorously employed by neuroscientists in the centuries old debate over free will (e.g. Libet 1999, Haggard 2011). In that context, "volition" is taken to denote acts whose presence or absence ahead of performances accounts for the *voluntariness* or *involuntariness* of those performances.

Given that "volition" derives, primarily, from the practice of describing performances as voluntary or involuntary, I argue that the explanatory utility of volitions is questionable.

First, there is the possibility that voluntary performances do not pragmatically imply volitions in the strong sense, i.e. it is coherent to assert that some performance was (i) voluntary and (ii) preceded by no act of volition. Even if one could successfully devise a test analogous to Moore's paradox ("It's raining, but I don't believe that it is raining") with verbs such as "will", "want", "desire" or "choose" substituting the term "volition", the test would still be inconclusive. For instance, the semi-technical "I hit the president voluntarily, but I did not want to hit the president" allows certain flexibility as to the interpretation of "want", for my wanting to hit the president may be a state, a process and so on, with no set time frame.

Secondly, because volitions are not well entrenched in the appraisal practices, they lack relevance for the *attribution of voluntariness*. Suppose for a moment that volitions exist but an agent X can never witness an act of volition V of an agent Z. How does X find out whether Z's performance of G was voluntary of not? Most directly, X can do that by watching Z's G-ing. The observation allows X to *infer* from G to the act of volition V that preceded it. But the inference to V is superfluous. Clearly, when witnessing Z's G-ing, X already applies the criteria for attributing voluntariness to Z's G-ing without referring to V. This objection may be questioned on the grounds that volitions are witnessed in the first person. However, given the lack of appraisal practice with "volition", it is not obvious which other practices would be relevant to this first-personal perspective.

I suggest that the term "volition" be abandoned or adjusted to the distinction between voluntary and involuntary actions as outlined by Gilbert Ryle (1949). Typically, the distinction is employed when performances under evaluation are aberrant, i.e. "ought not to be done", and it is hypothesised that agents could be blamed for those performances' being so. Opposing the general trend among philosophers, Ryle maintained that praiseworthy performances are not interesting in that context, because it is somewhat unnatural to suppose that an agent whose performance displays competence, could have been equally competent to make an error. Having narrowed down the scope of performances relevant to the distinction, Ryle asked whether a given performance was (i) non-habitual and (ii) externally unaffected. If neither, then it was voluntary, otherwise not.

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POSTER PRESENTATIONS (BY ORDER OF RECEIVING)

EMOTIONAL INTELLIGENCE IN RUSSIA: GENDER AND AGE DIFFERENCES

Vetrova, I. (Institute of Psycholgy, Russian Academy of Sciences)

Emotional intelligence (EI) - a field of research, which is developing rapidly, including in Russia. We rely on a model of John D. Mayer, Peter Salovey, and David R. Caruso, who see emotional intelligence as an ability (Mayer, Salovey, & Caruso, 1997). They have made significant contributions to the study of emotional intelligence, and the MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test) is the product of their effort. We have translated MSCEIT into Russian and adapted it in the period from 2004 to 2009 (Sergienko, Vetrova, 2009). Now we have collected a large enough database to standardize the MSCEIT in Russia. We can also compare these data with those obtained by the authors test using the English version of MSCEIT.

The normative data for the English MSCEIT is a base of 5000 respondents (1866 males, 2599 females and 535 unreported) (Mayer, Salovey, & Caruso, 2002). Now a Russian sample creates a normative base of 1297 respondents (535 males and 762 females). In the near future we plan to expand a normative base. But now, this group can be found gender and age differences in emotional intelligence.

The age range is also well represented in this group - from 16 to 72 years. The majority of the sample was under the age of 30, with a mean of 28,8 (SD = 10,35). This corresponds to the English-language data (mean = 24.13, SD = 9.89). Group 16-19 years represented 205 persons (118 males, 87 females), group 20-29 years represented 615 persons (247, 268), group 30-39 years represented 254 persons (89, 165), group 40-49 years represented 155 persons (52, 103) and group 50+ years represented 68 persons (29, 39).

It was shown that the average values %u200B%u200Bfor the overall level of EI, as well as for individual domains, branches EI and sections of the MSCEIT, significantly lower than in the English version of the test. We suggest that this may be due to cultural differences or the fact that while our sample is not as broad as that of our colleagues. We also found a more notable age and gender differences in the level of emotional intelligence.

Drs. Mayer, Salovey, and Caruso indicate that women scored slightly higher than men on all of the scales. We found that women surpass men on all scales only at the age of 16 to 29 years. In the group of 30-39 years, women at the trends show the best results in section A (Faces). But in the ages of 40 and older has been increasing predominance of women over men in the two Branches of EI: Perceiving (Section A – Faces) and Facilitating (Section B – Facilitation).

Observations using the English version of MSCEIT indicated that the age differences were localized, with young adults (< 25) scoring significantly lower than older groups. The youngest age group scored the lowest on all of the branches, but the affect of age was only significant for Branches: Facilitating, Understanding and Managing. We are in his study found similar results in the total group and separately in menage differences are localized at the age of 20 to 30 years,

and appear only in the 3 Branches: Facilitating, Understanding and Managing. Among women age differences is much less pronounced and occur between 30 and 40 years only for the Branch Facilitating.

Thus we have once again confirmed the validity and reliability of the Russian version of the MSCEIT. In addition, we identified culturally specific gender differences in the level of emotional intelligence.

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ONLINE SHOOTER GAME AS A POLYGON FOR THE COGNITIVE AND SOCIAL EXPERIMENTS

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Since the beginning of the human history, games entertain, train and educate the mankind. Chess and checkers develop strategy skills, football improves the teamwork and puzzles plays an important role in the cognitive development. The introduction of computer games simplified game's creation, and so more games become available to play. Online games allow people communicate while playing, and therefore boost their social skills as well. Online computer games have recently become a subject of the sociological and cognitive researches. However, only observations of online games are usually available, because one need to create his or her own game to conduct active experiments. In this article, we present the online shooter game that is developed by ourselves exactly to conduct cognitive experiments.

Our game is a shooter collective game. At this time, the basic features of the game are developed: running, shooting, interaction with objects, messaging, etc. The game's client is a thick web client, which performs game's physics and drawing. It is written in Javascript language with the usage of *jsgamesoup* and *SignalR* libraries. The client does not require installation of any additional software. Server provides interaction between units: resolves collisions, delivers communication messages, and manages room's rules and scenarios. The main way of the game's distribution is supposed to be VKontakte (vk.com), the largest social network in Russia and one of the largest in Europe. Unlike Facebook, where many online shooters are available, there is a little competition in VKontakte. Our most prominent distinctions from the existing games are:

• seamless integration into social network, without any download or registration requirements;

• the free-of-charge access to the game (in the future, extra weapons or armor could be charged).

The primary aim of this game is collecting statistics about the player's behaviour, and constructing the levels so the statistics would be more informative. Possible directions of experiments are as follows.

• Ethical puzzles. For example, the betrayal of teammate could result in the additional bonus points, or a sacrifice of one teammate could save five others from

imminent death, etc. The ethical choice in game is more profound than one in a paper test, because it has the perceptible consequences: messages from teammates, perks at the social network profile, additional bonuses, etc.

• Turing-test variations: building bots that are indistinguishable from human-controlled players in both playing and messaging.

• Sociological observation: which behavior determines becoming a leader of a group, or how big the population of guardians should be to make a valuable prize undesirable, or in which situation can people create their own laws, etc.

• Cognitive experiments: how players explore the area in case of no map is provided, or how they find each other in a labyrinth, etc.

We believe that these and other experiments could be representative and informative only with a background research in psychology, sociology or philosophy. Online game experiment is no more than an amusing observation without a hypothesis is it used to confirm. That is why we are inviting colleagues researches to cooperative work on this project, and hope that our game will be useful as an experiment framework in many areas.

META PROBLEM AND PROBLEM OF COMPLEXITY AGAINST FREE WILL AND PROBLEM OF NORMATIVITY

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In the paper I want to show why the concept of free will shall be replaced in scientific exploration of any normativity by terms appropriate for Cognitive Science and Artificial Intelligence.

In the very first part I want to show that partial reductive explanation of any human behavior is grounded independently from many objections resulting from faulty understanding of fundamental philosophical problems such as meta problem and problem of complexity. Meta problem in general, having its source in philosophy, epistemology, logic, mathematics and even linguistics often recognized in problem of metaphysics, frame problem, ceteris paribus clause, regressum ad infinitum, Wittgenstein (Kripke) argument, liar paradox and mainly most prominent examples of Gödel limitation theorems and Turing stop problem clearly show limits of scientific exploration connected with any finite formalization of way of description. Problem of complexity originally raised from classical physics (recognized in effects of deterministic chaos), quantum physics and evolutionary biology disciplines also indicates limits of exploration connected with the need of the use of probabilistic methods and consequently the need of explanation with the use of the concept of chance/randomness. Randomness of systems in classical physics is connected with their great sensitivity on errors of measurement of initial conditions with regard to their non linearity and in quantum physics and evolutionary biology disciplines chance/randomness is understood as a structural part of explained "reality".

In the second part of the paper I want to show how models of human cognitive processes/mind deal with meta problem and problem of complexity by modeling them with different scale of openness (basing on greater or lesser axiomatic power) what in terms of representation is described with symbolic, subsymbolic and connectionistic methods. In particular I want to show the above on the grounds of disciplines dealing with problem of: (i) representation having its source in linguistics, philosophy, logic, computer sciences, psychology, artificial intelligence, neurobiology (ii) choice making having its source in mathematics (in particular game theory), psychology, economics, computer science, artificial intelligence, neurobiology and (iii) data processing systems having its source in logic, computer science, artificial intelligence, neurobiology what may be also understood as generalization of the above problems of representation and choice making. I also indicate that all the above problems from neurobiological (connectionistic) perspective are de facto one and the same thing, defined with the way how just neural networks work. Such perspective is currently described in Cognitive Science as an "embodied" perspective.

In the third and the last part I want to come to conclusion that no concept of phenomenal free will is needed for some at least limited understanding of human mind and trials of modeling thereof, but the concept of chance/randomness which contains any phenomena. For purposes of scientific explanation we shall reject the concept of free will, and explanation of any human behavior (also higher cognitive processes such as moral cognition) shall be made with terms appropriate for Cognitive Science and Artificial Intelligence. Then we can come to crucial conclusions for any debates running on the grounds of philosophical and especially normative disciplines: dualism versus monism (distinction of description and normativity), meaning of supervenience and emergence of mental/moral states or ontology of any norm as such. Of course we shall be aware that what we can do on the grounds of limited scientific explanation is not possible in common life. The idea of free will is necessary for human socialites. Rejection of the concept of phenomenal free would almost automatically trigger collapses of any normative systems (ethics, moral, legal) and would finally turn against these human societies by jeopardizing their fundamental need of safety.

COGNITIVE, VOLUNTARY AND EMOTIONAL CONTROLS AND FAMILY SYSTEM'S FEATURES IN THE STRUCTURE OF JOINT B

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Investigation is devoted to the family behavioral regulation. It is supposed that the family behavioral regulation is a joint process – the both of spouses use their own and also partner's regulation resource. The Control of behavior is a construct used to demonstrate the individual regulatory resources. It is the integrative characteristic which consists of 3 subsystems – Cognitive, Voluntary and Emotional controls.

It is also grounded that the consideration the family behavioral regulation as a joint process is the transition from the study of individual regulation of behavior to joint regulation and proposed the construct of "joint-regulation of behavior", defined as a process of mutual adjustment and coordination of regulatory resources of the partners interacting in the actual situation. It is assumed that the structure of the construct shows the specifics of these adjustment and coordination. Actual situation

is the specific moment in the personals' or groups' life that demand the special or new organization of resources necessary for goals obtaining.

The prenatal situation is the crisis period in family life. It is the time when joint regulation is very important for the best result – the future infant successful delivery and adaptation. Also it is the different if family is waiting for first or second baby. The first time is more stressful and crisis because there is not enough common experience or family cohesion. Such periods is widely studied in Family system theory. So the prenatal situation is the relevant for studying the joint processes in family.

The theoretical proposition was the assumption that the effective overcoming of family crisis is grounded by coherent structure of spouses' joint regulation of behavior. So it is supposed that there is matching between the spouses Cognitive, Voluntary and Emotional controls, the stage of family life cycle (the first or the second baby) and family cohesion (systems processes).

The differences in dynamics of family cohesion, individual control the behavior levels and structures of constructs of joint regulation of behavior was demonstrated by the example of marital dyads, waiting for the 1st and 2nd child, and thus being at different stages of family life cycle. We found that the tendency to over-unity is typical for the families waiting the first baby. And it is associated with less coordinated Control of behavior subsystems. The marital dyads waiting for the second baby tend to diminish interpersonal distance more seldom. So the structure of their joint behavioral regulation is more coherent. It concerns the Cognitive subsystem which is heavily coherent – the most of partners' cognitive features correlate. In the same time Voluntary and Emotional subsystems correlate with each other. And it is the important result because the emotions and vole behavior are the most problem point during the pregnancy.

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BECOMING ACADEMIC SCIENTIST: THE MODEL OF PSYCHOLOGICAL FACTORS CONTRIBUTING TO ACADEMIC ACHIEVEMENT

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The majority of studies concentrated on cognitive processing are classic laboratory experiments. In the present study we focused on the complex real-life cognitive activity – i.e. the cognitive activity of a scientist. The study aims at revealing sociopsychological factors that determine their productive cognitive "investment" in science. The following questions were formulated: 1) which scientific indices reflect the scientist's cognitive achievement; 2) which social-psychological factors determine the development of high cognitive achievement of the scientists?

Several fields of life experience that could contribute to the development of scientist's cognitive potential were examined: family background, scholastic and academic education and professional background. 170 young scientists from different scientific domains, research workers of the Russian Academy of Sciences and winners of the Russian Science Support Foundation, participated in this study.

The 4-factor linear structure model was constructed. The model showed a good fit to empirical variables corresponding to the respective parameters (Bollen-Stine bootstrap $\chi^2 = 102,729$; p = .081; GFI = .923; AGFI = .890; CFI = .966; RMSEA = .036). The model presents four latent factors. Two of these factors correspond to scientific indices of high cognitive achievement in science. These factors are loaded with such manifest variables as scientific citation indices (h-index and Russian citation index), number of publications in Scopus and total number of all academic publications, age of doctor degree, number of PhD students.

The other two latent factors represent the socio-psychological factors that contribute to the high academic achievement. The one factor represents family background and influences positive on native academic achievement. To the contrary, the other factor represents educational background and has positive influence on international academic achievement.

Thus, the model presents the structural conceptualization of high professional achievement in science and socio-psychological factors contributed to this achievement. We discuss our findings in terms of present studies of cognitive potential in science.

USAGE OF PERIPHERAL INFORMATION IN PROBLEM SOLVING AND GENERAL ABILITIES

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In a framework of dual process models of cognition abilities associated with processing of information subliminally or out of a conscious aim are usually viewed as correlates of creativity. For instance, G. Mendelsohn proposed a link between creativity and defocused attention and revealed that creative subjects were able to use peripherally presented cues in anagram solving more effectively than less creative subjects (Mendelsohn, 1976). According to C. Martindale creativity is linked to ability to switch between focused and defocused attention modes (Martindale, 1991). However some recent studies demonstrate that individual differences in implicit learning correlate with verbal intelligence (Kaufman et al., 2010). Thus correlations between general abilities and abilities to process information presented peripherally need to be further examined. The present study was conducted taken the above mentioned aim into account.

In the 1st study 131 psychology students participated (mean age was 19.5, SD=1.7). The experimental task was to judge whether presented pairs of 5-letter words rhymed or not. Thirty pairs were presented for 7 seconds each. Among the words forming pairs there were nominal nouns and city names. Afterword the participants had to name as many cities as they were able to. Thus the city names presented in the first task could be used as cues for the second task.

Verbal intelligence was measured by Russian version of the verbal scale of Amthauer's intelligence test. Creativity was measured by Guilford's Alternative Uses test, Russian version of the Remote Associates Test (Mednick, Mednick, 1967) and the TCT-DP (Urban-Jellen, 1996). Mean z-score on three creativity measures was taken as a total creativity score.

Multiple regression analysis was performed with a number of used cues as a dependent variable and verbal intelligence and creativity as independent variables. No significant effect of creativity on the use of peripherally presented cues was revealed (β =0.08, p=0.54; total amount of generated cities was controlled). But there was a significant positive effect of verbal intelligence on the use of peripherally presented information (β =0.3, p=0.05; total amount of generated cities was controlled).

The aim of the 2^{nd} study was to replicate this finding and to examine a wider range of intellectual abilities with respect to this effect. The sample consisted of 139 students (mean age was 15, SD = 0.5). The experimental procedure was the same. Abstract, spatial and verbal abilities were measured by a number of specially constructed psychometric instruments.

The hierarchical confirmatory factor analysis was performed. A three factor model of general abilities was confirmed with a G-factor on top and two first-order factors. The abstract and spatial intelligence subtests formed a first-order factor of fluid intelligence, while two verbal intelligence subtests formed another first-order factor of crystallized intelligence. A significant loading of crystallized intelligence factor on the manifest variable represented by the used peripheral stimuli was revealed ($\beta = .27$, p = .05). The model showed a good fit to empirical data (Bollen-Stine bootstrap $\chi^2 = 1.812$; p = .770; GFI = .995; AGFI = .981; CFI = 1,000; RMSEA = .000).

The results of two studies support our hypothesis that intelligence is linked to the ability to use peripheral information in problem solving. Moreover, this ability forms a part of the structure of crystallized intelligence. We discuss our findings in terms of the present theories of cognitive abilities.

HOW DEPENDENCIES BETWEEN THE CONSEQUENCES OF OPTIONS INFLUENCE PEOPLE'S PREFERENCES

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Standard economic theory of decision making assumes that people evaluate options independently of each other and choose the option with the highest utility. Due to the frequent violations of this prediction, theories based on the pairwise comparison of options, such as *regret theory* (RT, Loomes & Sugden, 1982), *decision field theory* (DFT, Busemeyer & Towsend, 1993) or the *similarity model* (Leland 1994, 1998) were proposed. Therefore, these models predict that the subjective value of an option always depends on the choice set.

RT proposes that the decision maker anticipates feelings of regret in case of obtaining lower winning compared to the alternative or rejoice the choice when gaining more than the not-chosen option. The decision is made such that the possible regret is minimised. DFT conceptualises preference probabilistically. It assumes that the choice options are compared attribute-wise and information about each option is accumulated in a noisy way. Once the required threshold for the information is accumulated or the time is over, the decision is made. According to RT and DFT, larger covariance should lead to increased choice probabilities. To test

this assumption we conducted an experiment in which the options' consequences were dependent on the outcome of an external event and therefore covaried with each other.

We presented a set of 180 stochastically non-dominant binary gambles with fixed difference in expected values ($\Delta EV=15$) to 29 participants. The gambles were divided into 3 sets, according to the carefully selected ratio of covariance between two gambles' outcomes to the sum of variances of each gamble: 1) *small ratio* (*SR*), 2) *medium ratio* (*MR*), 3) *large ratio* (*LR*), where the higher the ratio the larger the covariance relative to the variances. As expected, there was a stronger preference for the choices with large covariance ratio compared to medium and small ratio choices and resulted in the relation such that *SR*<*MR*<*LR*.

Further, using maximum log-likelihood method we fitted parameters of two models that assume pairwise comparison, DFT and RT, and two models being in line with the standard economic theory, probabilistic version of *expected utility theory* (EU, von Neumann & Morgenstern, 1974) and *cumulative prospect theory* (CPT, Tversky & Kahneman, 1992). DFT and RT predictions mimicked the pattern observed in the data such that the higher the covariance ratio the higher the choice preference expressed as higher probability. In contrast, EU and CPT predicted no difference. DFT had the best fit to the data measured with the Bayesian Information Criterion.

Our results indicate the importance of the covariance between the choice options, where the covariance is assumed to be an abstract representation of computations made on the neural level (see Busemeyer & Townsend, 1993). Further research is needed to investigate this issue in terms of brain activity, and to explore more the perception of the covariance by the decision-maker.

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AWARENESS OF INTENTION: THE PHENOMENA AND ITS NEURAL CORRELATES

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Over the past few decades the group of problems associated with the question of free will has attracted much attention. One of these disciplines focuses on the

examination of intentions and their reflection by consciousness. The goal of my talk is to present the idea of my upcoming research on the **Awareness of Intention** using both philosophical and experimental approaches.

The central concept of the presentation is the Awareness of Intention, understood as *conscious awareness of one's own intention* to perform a motor action. The goal of my research work is *mapping the neural to the phenomenal*. To my knowledge, this topic has not been explicitly addressed yet, although there are a number of sources available giving some inspirations (e. g. Soon, Brass, Heinze & Haynes, 2008). In relation to the research question two main tasks appear: (a) Define the term Awareness of Intention and provide delimitation of phenomenal qualities. (b) Find out which brain regions encode the intention when it enters into conscious awareness a few hundred milliseconds prior to the movement.

Contemporary experimental literature suffers from vague and unsystematic terminology. Therefore a short overview of common terms used in the field and definition of several key terms will be included together with considering their philosophical notion.

Experiment

My research proposal has two main objectives. (1) **The first question** is whether intention awareness and voluntary action are dissociable. In other words – whether it is possible to **eliminate intention awareness** (experience of intention) without disrupting the capability for volitional action. (2) **The second question** is finding neural correlates of *intention awareness*.

To answer these questions I propose an experimental design based on rTMS inhibition of particular ROI, followed by behavioral experiment (possibly performed in fMRI). The experimental design and setup will be presented.

If a particular ROI is responsible for **intention perception** then a temporal disruption of its function will result in *distorted perception* of subject's intentions. We may expect either partial distortion – manifested by later reported time of intention – or absolute distortion – manifested as total *inability to report the moment of decision*.

Regions of Interest

As far as I know, there is no single brain center directly linked to intention awareness. Based on literature review, I have identified three prospective regions of interest: precuneus/PCC, medial frontal lobe and pre-SMA (Lau, Rogers & Passingham, 2007).

I will put my hypotheses in context with the main contemporary framework (Haggard, 2008). An overview and polemics about methods of measuring the perception of time will also constitute an important part. Especially with regards to Dennett's and Libet's findings about subjective timing of events. Attempt at quantifying events in the inner, phenomenal sphere is methodologically problematic and in fact considered a crucial difficulty of the interdisciplinary Science of Consciousness.

The purpose of the talk is to give a public presentation of my research proposal I intend to conduct at the Medical Faculty of Masaryk's University in Brno, Czech Republic. I hope to receive some inspiring comments and notes from the present

scientific community. Potential future international collaboration will be only welcomed.

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COGNITIVE TRAINING – PAST, PRESENT, AND SOME IMPLICATIONS

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Curiosity and the need to improve are manifest throughout the history of mankind. Nowadays, we have a special opportunity to know and improve ourselves with the means of psychology and cognitive sciences. But what do these improvements actually translate to, and what are the possible consequences of such efforts? Reflecting shortly on terminology of cognitive psychology, we present preliminary results of our own study in cognitive training. Finally, we outline some perspectives on improving intelligence, and try to validate some popular misconceptions.

TRAINING SUBJECTIVE EXPERIENCE IN BINOCULAR RIVALRY

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When two different images are presented to the corresponding retinal locations of two eyes, one experiences alternations in perceptual experience – phenomenon known as binocular rivalry. Dissimilar monocular images compete for access to consciousness resulting in one image dynamically changing into the other. Each dominates perception for a few seconds, usually with periods when blend of two images is perceived. Diversity in experience is being observed, with temporal properties of rivalry changing in stochastic manner. Because of the dissociation between constant physical stimulation and fluctuating phenomenal experience, binocular rivalry paradigm is widely used in search for neural underpinnings of visual awareness.

Some authors include this phenomenon to broader category of bistable perception (e.g. ambiguous figures) suggesting the same mechanisms are being involved. In spite of being subject of the intensive investigation, it is still unclear what are the mechanisms leading to rivalry, where they transpire in the brain and comprehensive view on this matter is yet to emerge. One factor that has been studied is the influence of attention on different properties of rivalry.

There are findings showing significant impact of attention on rivalry, for example, attention can bias initial dominance at the onset of a rival stimulation or lengthen subsequent durations of a dominance. Moreover, early studies suggest that the instruction given to participants can influence perceptual transitions in binocular rivalry resulting in changes of a subjective experience of stimuli.

Here, we further investigate this finding asking whether it is possible to learn to control intentionally a perceptual experience in binocular rivalry. We hypothesized that people can develop new subjective experiences of stimuli through learning, as predicted by the Radical Plasticity Thesis (Cleeremans, 2011).

To test this prediction, we conducted an experiment using a pair of complementary images that were presented dichoptically with a use of a stereoscop. Stimulus presented to the left eve consisted of horizontal lines on the left side of the image and semicircles on the right side. Stimulus presented to the right eye was an inverted version of the left eye stimuli. Consequently participants could perceive either left horizontal lines/right semicircles turning into right horizontal lines/left semicircles or integrated images i.e. only horizontal lines or whole circles. To test whether training leads to control of perception in binocular rivalry, we asked participants to control their perception by trying to focus on one of the possible percepts for the whole block of the task. We trained participants for 20 blocks, 1 minute each, counterbalancing the stimuli that presented to participants. As a result of the training, we expected participants to report proportionally longer perception of the image that they were required to focus on. Since the experience changes have been induced by training without any changes in stimulus presentation, we claim to manipulate the metarepresentational redescriptions. That is why our project revolves around top-down influences of the cognitive system on a conscious experience.







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