

THINKING WITH HANDS EYES AND THINGS

AN INTERNATIONAL
AVANT-CONFERENCE
2013, TORUN, POLAND

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TRENDS IN INTERDISCIPLINARY STUDIES

An International Avant-Conference 2013

7 + 8–10 November 2013, Torun, Poland

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The conference is supported by
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*Thinking with Hands, Eyes and Things*¹

It is a banal claim that both the body and the environment are involved in our experience of the world. The point, however, is that the whole body as well as its interactions with the environment play a crucial role in our mental processes. Cognition may involve integration with our tools, and we may even delegate some of our thinking to the environment. According to situated cognition and extended mind approaches, humans use elements of their environment as external components of cognitive processes or as means of reducing the complexity of the cognitive problems they face. The theory of affordances connects observers and environments in the act of cognition and cuts across the dichotomy of subjective-objective. Some researchers treat the immune system as a kind of cognitive system. Proponents of embodied cognitive science maintain that aspects of the body beyond the brain play a significant role in cognition. Science, Technology & Society Studies seem to support and complement this way of thinking. The claims made above are far from uncontroversial, however. Their critics assert that since research results in cognitive science do not lend sufficient warrant to the theses of embodied, distributed, extended or situated cognition, the non-neuronal body and elements of the environment play a peripheral role in cognitive processing.

Thinking with the body/environment – or thinking in the body/environment? Is the question appropriate or simply misleading in the second decade of the 21st century?

We invite you to participate in the conference devoted to extra-neural aspects of cognition as well as controversies related to them.

¹ "Thinking with Hands, Eyes and Things" is a paraphrase of a famous Bruno Latour's sentence from: B. Latour. 1986. *Visualisation and Cognition: Drawing Things Together*. H. Kuklick, ed. *Knowledge and Society Studies in the Sociology of Culture Past and Present*. Jai Press, vol. 6.

Special Guests of the Conference

Christopher Baber

University of Birmingham

His research interests focus on the many ways in which computing and communications technologies are becoming embedded in the environment around us and the things we use on a daily basis. Not only do we have significant computing power in the mobile phone in our pocket, but, increasingly, other domestic and personal products are gaining similar capabilities. He is interested in the development and the effect of such technologies on human behaviour. [from Ch.B. webpage]

Christopher Baber's webpage::

<http://www.eee.bham.ac.uk/baberc/>

Anthony P. Chemero

University of Cincinnati

His research is both philosophical and empirical. Empirical interests are: Dynamical Modeling, Phenomenology, Artificial Life. Philosophical areas: Philosophy of Cognitive Science, Philosophy of Science. He claims that consciousness, like thinking more generally, happens in brain-body-environment systems. In his opinion the theory of affordances discloses truths about both observers and environments. He is working with M. Silberstein on a new theory of dynamical explanation. [from A.Ch. webpage and interview]

Anthony P. Chemero's webpage:

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Alan Costall

University of Portsmouth

His work has been an attempt to develop an alternative approach to mainstream cognitivist psychology, based on the mutuality of animals and environments, people and their situations. His research interests include: psychology of art, event perception, the meanings of things and others. The topics of his current courses are ecological psychology, and the nature of science, but have also presented courses on the psychology of art, and on Darwin's impacts on psychology. [from A.C. webpage and interview]

Alan Costall's webpage:

<http://www.port.ac.uk/departments/academic/psychology/staff/title,50471,en.html>

Daniel D. Hutto

University of Hertfordshire

His research is a sustained attempt to understand human nature in a way which respects natural science but which nevertheless rejects the impersonal metaphysics of contemporary naturalism. His recent projects have focused on consciousness, intentionality and everyday social understanding. He regularly speaks at conferences and expert meetings for clinical psychiatrists, educationalists, narratologists, neuroscientists and psychologists. Co-author of the book *Radicalizing Enactivism. Basic Minds without Content* (2013). [from D.D.H. webpage]

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David Kirsh

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For the last years he has been carrying out research in three different but complementary areas: Theory of Interaction, Environment Design, Information Architecture. He is interested in how people think with things, what being situated, embedded and embodied means, how they project structure onto the world to facilitate interaction, and how they make sense of instructions. He is also interested in design and especially how to design interactive artifacts and experientially rich environments. [from D.K. profile on academia.edu and his webpage]

David Kirsh's webpage:

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Robert K. Logan

University of Toronto

He has a variety of research experiences. His interests include: Linguistics: the origin and evolution of language (the Extended Mind Model for the origin of language, the human mind and culture); Social Impact and History of Media; Science Education; Use of Computers in Education; Knowledge Management; Biocomplexity; The Strategic Innovation Lab at OCAD: Design and Emergence; Information Theory. He published with and collaborated with Marshall McLuhan. [from R.K.L. webpage]

Robert K. Logan's webpage:

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Richard Menary

Macquarie University

His research interests include: Philosophy of Mind: Consciousness, the self, mental representations; Philosophy of Cognitive Science: 4E cognition (embodied, embedded, extended, enacted), theory of mind, modularity, cognition and external representations, expertise; Pragmatism: Charles Sanders Peirce, John Dewey; Virtue theory as it applies to both ethics and cognition/knowledge. Over a number of years he has been developing a model of cognition called Cognitive Integration. [from R.M. profile on <http://www.mq.edu.au>]

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Erik Myin

University of Antwerp, Belgium

His main research areas are: philosophical psychology, philosophy of cognitive science and philosophy of mind. With Daniel D. Hutto, he wrote a book *Radicalizing Enactivism. Basic Minds without Content* (2013). In this book, they promote the cause of a radically enactive, embodied approach to cognition that holds that some kinds of minds -- basic minds -- are neither best explained by processes involving the manipulation of contents nor inherently contentful. [from E.M. webpage and <http://mitpress.mit.edu>]

Erik Myin's webpage:

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J. Kevin O'Regan

Université Paris Descartes, France

His work involves exploring the empirical consequences of a "sensorimotor" approach to vision and sensation in general. A researcher of the phenomenon of "change blindness". His main present interest is one particular aspect of the problem of consciousness, namely the "what it's like" of sensory experience: why red seems red to us rather than seeming, say, green, or like the sound of a bell, or even like nothing at all. He is interested in applying his work to robotics. [from J.K.O'R. webpage]

J. Kevin O'Regan's webpage:

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Joanna Rączaszek-Leonardi

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Her research interests include: Cognitive Science, Psychology of Language, Dynamical Psycholinguistics, Distributed Cognition, and others. Selected research projects: 'Hyperspace Analogue to Language: a Tool for Semantic Analysis of Linguistic Corpora', 'Differences in language structures as a guide to studying differences in cognition: articles and gender', 'Multi-scale dynamics in the explanation of linguistic phenomena: identifying time scales and finding measures'. [from J.R-L. profile on academia.edu]

Joanna Rączaszek-Leonardi's webpage:

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HAT Center

The Interdisciplinary Research Center Humanities/Art/Technology was founded in 2011 at Adam Mickiewicz University in Poznań. It is the first research institution in Poland which deals with transdisciplinary research and encompasses projects that often cannot be realized within the conventional confines of science and art. The main goal of HAT Center is to conduct and initiate innovative projects, which execute the idea of synergetic collaboration between professionals of different disciplines of science, technology and art. The strategy of development adopted by HAT Center includes interrelated research domains such as: interactive forms of image and sound, games and nonlinear narrations, sensorial perception, posthumanism and transhumanism, innovative forms of embodied knowledge, motion in media structures and somatic interface. The idea of HAT Center is to find practical solutions within experimental research, which could be implemented in the contemporary media reality, as well as those, which will be extending the boundaries of constituted knowledge domains by indicating new and creative possibilities of scientific, technological and artistic developments.

Program director: **Agnieszka Jelewska** – researcher, lecturer and sometimes practitioner. Since 2001 she has been the lecturer at the theatre studies of Adam Mickiewicz University in Poznań. She carries out interdisciplinary research on theatre, dance, visual culture, architecture and new media.

Program coordinator: **Michał Krawczak** – awarded his MA at the theatre studies of Adam Mickiewicz University in Poznań. His main fields of interests in the contemporary art and culture are: feedback-loop, digital re-presentations and modern concepts of synesthesia.

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Embodied and distributed remembering

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‘Exograms’ are defined as external symbolic devices linked to the present context of remembering that allow us to extend and enhance our bio-memory systems (Donald 2010). Donald argues that ‘exograms’ enable human beings to manipulate complex representations by significantly augmenting the capacity of working memory. In this way, non-biological memory storage (e.g., photographs) together with the bio-memory systems create the conditions for the emergence of distributed hybrid networks formed by the interwoven neural capacities and external memory devices (Sutton et al., 2010). Thus, conversations among members of small groups may be considered as good examples of collaborative activities in which distributed and hybrid memory systems, constituted by the interplay of biological and social resources, may emerge.

Experimental (e.g. Harris et al., 2011) and ethnographic studies (e.g. Dahlbäck et al., 2013) on collaborative remembering in dyads or small groups have based their findings merely on the systematic analysis of verbal behavior, leaving the entire multimodal dimension of collaborative remembering aside. I believe that this important methodological limitation is related to the fact that most of their analyses are solely based on written transcripts of social interaction, and thus do not consider the richness of multimodal interaction in conversations about past experiences.

The purpose of this study is to provide a first step towards a cognitive ecology of collaborative remembering driven by a more ecologically valid method of investigating the ways in which members of a small group align multiple behavioral channels in an everyday environment, and whenever it is possible, in relation to real-world activities that were meaningful for the participants involved in the research. The concept of cognitive ecology refers to the study of cognitive phenomena in context by pointing to the web of mutual dependence among the elements of a cognitive ecosystem. Starting from the previous studies of collaborative remembering in multimodal interactions in natural settings (Bietti and Galiana Castello, in press; Cienki, Bietti and Kok, in press), the aim is to understand the cognitive ecology of collaborative remembering not only as it accounts for what people say (verbal behavior) but also for what they actually do (non-verbal behavior) when they are remembering specific experiences together in everyday environments.

References

- Bietti L and Galiana Castello F (in press) Embodied reminders in family interactions: multimodal collaboration in remembering activities. *Discourse Studies*.
- Cienki A, Bietti L and Kok K (in press) Multimodal alignment during shared remembering. *Memory Studies*.
- Dahlbäck N, Kristiansson M and Stjernberg F (2013) Distributed Remembering Through Active Structuring of Activities and Environments. *Review of Philosophy and Psychology* 4 (1): 153-165
- Donald M (2010) The exographic revolution: Neuropsychological sequelae. In Malaforis L and Renfrew C (eds) *The Cognitive Life of Things: Recasting the Boundaries of the Mind*. Cambridge: McDonald Institute Monographs, pp. 71-79.
- Harris CB, Keil PG, Sutton J, Barnier A and McIlwain D (2011) We remember, we forget: Collaborative remembering in older couples. *Discourse Processes* 48: 267-303.
- Sutton J, Harris C, Keil P and Barnier A (2010) The psychology of memory, extended cognition, and socially distributed remembering. *Phenomenology and the Cognitive Sciences* 9 (4): 521-560.

Iterated patterns of ReHo and ICA in children with auditory processing disorder: resting-state fMRI study

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Introduction: Auditory processing disorder (APD) describes listening problems manifested by poor sound localization, auditory discrimination, auditory pattern recognition; temporal aspects of audition; auditory performance in competing acoustic signals (ASHA, 2005; Chang, Keith, 2009; Dawes et al., 2008; Miller et al., 2011).

The neural correlate of central auditory dysfunction is poorly understood. Recently, there is a growing interest in the investigation of spontaneous brain activity as researchers claim that alterations in patterns of intrinsic activity of the brain might be implicated in various brain disorders (Paaki et al., 2010; Raichle, 2001; Yu-Feng et al., 2007). Resting-state fMRI is fast developing field and various methods are applied to analyze the data (Cole, Smith, & Beckmann, 2010). To date, the most popular method for identifying intrinsic interactions among multiple brain regions is independent component analysis (ICA). Another, novel approach is ReHo which investigates the congruency of the time series of a given voxel (Liu, et al., 2005; Zang et al., 2004).

However, according to the authors' knowledge, there is no study which first, applies ReHo and ICA method in one study, and secondly, investigates spontaneous brain activity within children with APD. Therefore, the aim of the presented study was to investigate the baseline brain activity in children with CAPD in comparison to healthy controls with the use of two independent methods: ICA and ReHo.

Methods: 13 children with APD (aged: 7-16, mean=11) and 15 healthy children (aged: 7-16, mean=11.2) participated in the resting-state fMRI scans. The study was performed in the 3T MAGNETOM TRIO scanner at the Bioimaging Research Center in Institute of Physiology and Pathology of Hearing. With the use of two independent methods (ReHo and ICA) we compared the differences between the two groups within DMN.

Results: Interestingly we found a component with spatial features consistent with the DMN nodes provided in the literature (Damoiseaux et al., 2006; Raichle & Snyder, 2007) in both groups with the use of two methods. Nevertheless, the two-sample t-tests performed on results obtained with the use of ICA and ReHo showed group's differences in regions encompassing DMN nodes: posterior cingulate cortex (PCC) and medial frontal gyrus (MFG).

Conclusions: The resting-state fMRI paradigm suggests that children with APD present altered spontaneous brain activity in comparisons to healthy controls. The most apparent differences were observed within regions implicated in attentional network. The study suggests that alternations within intrinsic brain activity which may underlie pathophysiology in children with APD.

The Ouroboros Model embraces its sensory-motoric foundations

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The Ouroboros Model offers a novel proposal for a biologically inspired cognitive architecture, which is built around an algorithmic backbone of iterative and self-referential processing. A key tenet sees all memory content as organized into meaningful junks, called schemata, scripts or similar. Many of them are laid down as a kind of snapshot of all activations in a living brain at a particular point in time. Following another route, categories can also be distilled from statistical regularities and co-

occurrences of arbitrary features. In addition, effective schemata can be assembled on the fly from combinations of preexisting building blocks, i.e. (parts of) already available schemata as a response to an (external) trigger. Especially for the first case, all principally possible content, e.g. sensory percepts, bodily reactions, action dispositions and associated preexisting conceptualizations are tied together as they are jointly activated at the same time; thus also the most abstract symbols are finally grounded in the body of the agent. For the reactivation of a schema it later suffices to excite a part of such a complex to reinstate the entire concept and to reestablish the associated context for any actual action. The Ouroboros Model offers a natural way of explaining how very rich representations are tightly interweaved and how, starting from different venture points and diverse triggers, similar courses of action and the same outcomes can result. Embodiment is an indispensable ingredient for the working of (situated and abstract) cognition following the Ouroboros Model, not only as substrate or a vehicle for action but as integral constituent for the cognitive functioning of any individual and autonomous human, animal (or artificial) actor in the real world. Active visual search is just a simple example; the exploration of the environment and its relevant features can always be conceptualized as mutual interaction between an actor and her surroundings or niche. A case in point are affordances of objects in a context directing specific (re)actions of an agent. Notwithstanding the importance of interaction with the actual environment, other agents in a community are recognized as providing the most important scaffolding for any cognitive behavior. It is claimed that the proposed mechanistic account with well specified processes in due succession and appropriate emphasis on time as a decisive parameter transgresses the traditional distinction between monist or dualist approaches and can overcome the impasse of the purported vicious cycle of neural representations and correlates of consciousness, the “hard problem”. On a more mundane level, the intrinsic features of a consistency check termed consumption analysis offer a functional explanation of change blindness as resulting from the underlying dynamic neural mechanisms under time constraints; the evocation of attention-grabbing sensations and ensuing affects and emotions follow en suite. Whatever the issue, the Ouroboros Model holds that a compound of grounding, coherence and consistency in the widest accessible frame of reference including amongst many others also cultural aspects can serve as our best guide to truth. How the Ouroboros Model could offer an overarching framework with the promise to reconcile purportedly incompatible or even contradictory models of the intricate functioning and essentially self-steered advancement of cognition is the subject of work in progress.

A time for art. A cognitive deposit of chronology in artistic construction of opus

Magdalena Brodziak

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The paper challenges the cognitivity of relation between the scheme of time and artistic form by an attempt of complete transcription of time's influence on the vision of a creator during the mechanisms of inventing and visualisation. The aim is to synonimize the formlessness of chronology and its neutral character with the series of strict singular operations on artistic ground which is also equivalent to artist's semi-sacral confidence and his active cooperation with philosophy based on cognitive reasoning. The theorem of perceiving time and art as a homogenetic structure which smoothly transgress even the limits of dualism, the most popular and often misused term for a transcendental comparative processes, is amplified by examples of consensuses between somehow mechanical, imperfect, and humane image of artistic sketch and the frames of time as an interpretator or the critics. Thus, the thesis triggers the diversity of research methods including the anti-generic approach to paradigm (modification)

and original approach to universal problems. A connectedness to the first method is exemplified by adjustment of Alan Turing's well-known decalogue of neuro-cognition to the conceptuality of an artist/art. The danger of disharmony and diminishment caused by the semi-negation of the Turingian dogmatic values is successfully avoided thanks to idiomatic callibration of those thesis based on proportional addition of both artistic and seasonal particle.

The second segment of the paper is devoted to the creative interpretation of a typically universal leitmotifs such as timelessness of work, work's construction time, the level of artistic code's attractiveness in specific era, recipients' dynamic code of aestheticism, and the establishment of the artistic newspeak slightly compatible with the character of prosaisms of the times.

Mark Rothko, Erwin Wurm, William Kurelek, Caravaggio and Stendhal are chosen to be the providers of the sensual and practical meaning of proposed concept of non-linear art determined by time. What is more, the author expands the role of those five artists not only by presenting their excellent infiltration in the matters but their awareness and active participation in the creationism of the periodical imagist new-speak, partly dictated by solipsism. Their insightful observation of time's limit deserved to be appreciated and emphasised by the series of special terms which personalize the scale of visionarism and the level of respect to the periodical predeterminations. The neologic agenda of those artists also contributes to the overall perspective on the seasonal trajectory of the newspeak as it should be first classified as "direct and conscious" or "indirect and unconscious".

Sensory Substitution: A Merleau-Pontian Account

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In this paper I formulate a Merleau-Pontian understanding of sensory substitution in contrast to four lines of thought in contemporary philosophical discussions of sensory substitution. I argue that the Merleau-Pontian account is both consistent with the empirical facts and better suited to capture the experiential and existential dimensions of sensory substitution.

Sensory substitution devices (SSDs) are prosthetic technologies that allow blind subjects to perceive their surroundings by augmenting their remaining sensory capacities. Tactile-visual substitution systems (TVSSs) are SSDs which translate visual information from a portable (e.g. head-mounted) camera into patterns of tactile sensory stimulation via vibrators attached to the subject's body (e.g. Bach-y-Rita 1972). After periods of adjustment, subjects report experiences more akin to sight than touch. For example, they 'see' objects in front of their bodies despite the vibrators being attached to their back (ibid.). Philosophers have tended to interpret TVSSs in one of three ways. Either TVSS users' experience genuinely pertains to the visual sense (Noë 2004, Hurley and Noë 2003), is purely tactile in character (Prinz 2006, Block 2003), or is neither exclusively visual nor exclusively tactile. Two influential variations of this third option are Myin and Auvrey's (2009) claim that TVSSs yield a new form of 'extended' perception, and Ward's claim that TVSS users develop a form of acquired synesthesia (Ward & Wright 2012; Ward & Meijer 2010).

Merleau-Ponty (1945/2012) argues that sensory experience is – in a qualified sense – irreducibly synesthetic, in that the senses function uniformly and holistically, and that this phenomenal uniformity owes to an integrated but adaptable nexus of pre-reflective sensorimotor capacities – the body schema. From this Merleau-Pontian perspective, I subject each of the above interpretations of TVSSs to a phenomenological critique. Following Merleau-Ponty, first two interpretations are rejected because they fail to do justice the phenomenology of TVSS. I then use Merleau-Ponty's phenomeno-

logy to sketch a hybrid view according to which the phenomenology of sensory substitution is understood as a reorganisation of the senses via an adaptation of the pre-synesthetic body schema.

I conclude by highlighting reasons to take the Merleau-Pontian interpretation seriously. I argue that many extant interpretations cannot do justice to blind subjects' reports of seeing the world via their TVSS because they are plagued by false dichotomies between touch and vision, and as such fail to recognise the existential significance of SSDs, namely, they way in which being-in-the-world is embodied through them.

References

- Auvray, M. & Myin, E. (2009), 'Perception with Compensatory Devices: From Sensory Substitution to Sensorimotor Extension', *Cognitive Science* 33 pp.1036-58
- Bach-y-Rita, P. (1972), *Brain Mechanisms in Sensory Substitution*, Academic Press
- Block, N. (2003), 'Tactile Sensation via Spatial Perception', *Trends in Cognitive Science* 7:7 pp.285-6
- Hurley, S., & Noë, A. (2003). 'Neural plasticity and consciousness' *Biology and Philosophy* 18, 131–68
- Merleau-Ponty, M. (1945/2012) *Phenomenology of Perception*, trans. D. Landes, London: Routledge
- Noë, A. (2004), *Action in Perception*, MA: MIT Press
- Prinz, J. (2006), 'Putting the Breaks on Enactive Perception', *Psyche* 12:1 (online)
- Ward, J. & Meijer, P. (2010), 'Visual experiences in the blind induced by an auditory sensory substitution device', *Consciousness and Cognition* 19 pp.492-500
- Ward, J. & Wright, T. (2012), 'Sensory substitution as an artificially acquired Synesthesia', *Neuroscience and Biobehavioral Reviews*, in press

March of the Analysts: Existential Overload and the Limits of Understanding in the Social Sciences

Ivelin Sardamov

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Recent decades have seen increased efforts by social scientists to devise evidence-based solutions to various social problems, and by governments to adopt public policies informed by such findings. This tendency has been reinforced by the more recent explosion of "big data." These developments represent a victory of a version of "positivism" in the social sciences and related policy areas. The triumph of positivism in many social and policy fields, however, may not reflect a superior understanding of social institutions and human motivation, but a form of subtle neurophysiological dysfunction. Neuroscientists have identified two different modes of thinking: 1) social, appropriate for the understanding of social situations, and 2) mechanical, geared toward the analyses of physical phenomena. Each of these modes of thinking recruits a different neural network which is geared toward addressing a different set of problems – related either to the manipulation of physical objects, or to the empathic understanding of the intentions of others. These two networks interact differently with physiological processes in internal organs and the whole body – one is more closely integrated with these, the other has a more abstracted mode of operation. When one of these networks is activated in response to appropriate stimuli or tasks, the other is inhibited, as our brains need to oscillate between two different modes of neural activation. Positivists in the social sciences may represent a subset of individuals in whom this process is disrupted, so they are less sensitive to bodily signals and cannot easily switch between the two networks according to the demands of the situation. As

a result, they tend to apply detached, reductionist analysis even to problems which call for empathic or holistic understandings; and fail to grasp the limitations of their own thinking. This neurophysiological syndrome probably reflects a degree of emotional desensitization resulting from the existential overload associated with modernized, highly complex and technologically saturated societies.

Fellows we live by. Literary character as a tool for thinking and problem-solving

Magdalena Rembowska-Pluciennik

The Institute of Literary Research. Polish Academy of Science

The aim of my article is to analyse the cognitive value of literary/fictional character. Cognitive narratology and cognitive theory of a literary character offer new explanation for the phenomenon of emotional response towards fictional people. Drawing on results from cognitive theory of intersubjectivity I would like to show how we use fictional human beings as a tool for thinking and problem-solving. We use fictional stories not only to describe the outside world but to engage the other (a reader) in cognitive cooperation. The real object of that cooperation is a fictional person, since it is a mode of functioning of human mind to think of someone else's thinking. A narrator can present a story as seen through the eyes/ felt through the senses of fictional person. Simultaneously it can make a reader feel as if they are witnessing events and experiencing emotions/ impressions of a fictional character. My objective is to describe how human ability to predict or imagine how things are going to unfold and people are going to act is connected with our capacity to design fictional stories. Building a mental representation of a real/ fictional person we have to represent the emotions, desires, attention, knowledge and qualia of others. Creating a fictional character can be seen not only as a capacity to represent reality, but also as a human innate ability of simulating someone else's experience. Stories about fictional people is a way of building up a repertoire of behaviours and human actions that can be used on later occasions. From a reader's point of view such a mechanism is vital for improving some important cognitive and social skills and competencies. Understanding literary character always involves processing strategies (identification, embodied simulation, mindreading) that we use in social environment. This means that -to some degree - reading resembles an individual and cultural exercise in switching and managing various cognitive perspectives - different from actual perspective of a reader. This is a mental operation human beings are especially good at. That is why a literary character can be treated as a part of human metacognition and a vehicle for perspective planning. I will point out some literary means used to establish, maintain, modify other person's perspective.

Loops, Constitution, and Cognitive Extension

Orestis Palermos

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The 'causal-constitution' fallacy, the 'cognitive bloat' worry, and the persisting theoretical confusion about the fundamental difference between the hypotheses of embedded (HEMC) and extended (HEC) cognition are three interrelated worries within the debate over active externalism. The common point between all of them--and the problem they accentuate--is the lack of a principled criterion of constitution. In an attempt to account for what constitutes a cognitive system, mathematically oriented philosophers of mind and cognitive scientists (Clark & Chalmers 1998; Clark 2008; Chemero 2009; Froese et al. 2013) have previously suggested that the presence of non-linear

relations between the inner and the outer contributions is sufficient for cognitive extension. The abstract idea of non-linearity, however, can be easily misunderstood and has, in the past, led to incorrect and counterintuitive conclusions about what may count as part of one's overall cognitive system. A case in point is Chemero's (2009) defense of radical embodied cognitive science as a form of anti-representationalism, where he argues that objects of perception do not need to be re-presented as they can already count as part of the overall extended cognitive system. In order to prevent any further mistakes I revisit dynamical systems theory to study the nature of the continuous mutual interactions that give rise to the aforementioned non-linear relations. Moreover, focusing on these mutual interactions will allow us to provide two distinct arguments in support of the ontological postulation of extended cognitive systems, as well as an objective criterion of constitution. Accordingly, I put forward a version of HEC that treats continuous mutual interactions (and the resultant non-linear relations) not just as sufficient but also as necessary for cognitive extension. Such a qualified version of HEC may exclude certain alleged cases of cognitive extension where the agent does not mutually interact with his artifacts or the external world (e.g., perception, shopping lists and directory services), but it is immune both to the 'causal-constitution' fallacy and the 'cognitive bloat' worry, and it can also be sharply distinguished from HEMC.

References

- Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis*, 58(1), 7–19.
- Clark, A. (2008). *Supersizing the mind*. Oxford University Press.
- Chemero, A. (2009). *Radical embodied cognitive science*. MIT Press.
- Froese, T., Gershenson, C., and Rosenblueth, D., A. (2013). The dynamically extended mind. <http://arxiv.org/abs/1305.1958>

Mind Embedded or Extended? The tension in the Theory of The Situated Mind

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In the early 20th century, the development of cognitive science raised hopes for a justified, scientific depiction of the mind which was metaphorically called Mind as a Computer. This depiction of the mind strongly influenced the debate on cognition in the 20th century. However, in of its second half the critical voices have started to be voiced. Critics objected to the idea that the human mind could be captured in a series of problem-solving steps such as those found in the computer program. They proposed a new metaphor – mind as a dance between the brain, non-neural body resources and environmental structures. The main goal of the new vision of mind, called Situated Cognition, is to explain how the brain, body and environment work together to produce intelligent behavior. Philosophers working on this new perspective are trying to create a unified and fruitful interdisciplinary project which is aimed at shedding a new light on the problems of cognition. Even if possible this task cannot be easy. Situated Cognition is composed of at least three descriptions which could hardly be thought to present unified picture of the mind: the Embodied Mind, the Extended Mind and the Embedded Mind. They reveal the tension within the project which weakens its integrity. The basic assumption of Embodied Cognition is that humans' subjective experience of their bodies in action provides an important part of the grounding for language and thought. This claim seems to be inconsistent with functionalism based on the multiple realizability thesis. It posits that the human mind can be realized not only by the human brain but also by many other kinds of things. Proponents of the Embodied Mind contradict this view by demonstrating empirically that bodies are integrated with minds to such an extent that it may invalidate the very distinction be-

tween them, hence functionalism in its standard form has to be abandoned. The Extended Mind thesis is more compatible with functionalism. In short, it states that some mental processes are extended into cognizer's environment. There are proponents of the Situated Mind who argue that the Extended Mind is unnecessarily extravagant and unmotivated. Given the costs to intuition, there is no reason to view external resources as parts of mind rather than just as useful tools. In the paper I will point out the solution to the tension within Situated Mind which could be found in the Embedded Mind supported by Extended Functionalism. This view makes up a standpoint which preserves effective explanatory concepts of traditional cognitive science. It is unreasonable to give up such fruitful and unified framework under which so many psychological phenomena are explained. On the other hand, the narrow computational picture of the mind has to be modified in a situated manner. The best depiction of Situated Mind presents the Embedded Mind which skillfully composes the Embodied Mind with the Extended Functionalism. This position views the mind as a part of a wide computational cognitive system which integrates internal cognitive processes with bodily manipulations of external vehicles of cognition. These external stores are indispensable; in many cases they determine and shape cognitive processes in an essential way. Nevertheless, the external cognitive system is not a part of the mind, the mind is a part of the extended cognitive system.

The Hands that Do the Thinking: Interactivity in Mental Arithmetic

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Abstract for poster. Whether it is in mining distal cultural influences or using more proximal artefacts, problem solving in the wild routinely scaffolds on the basis of interacting with resources outside the head. This paper explores problem solving examined under lab conditions with a series of mental arithmetic problems. Outside the lab, individuals often gesture, point or use objects to help them to arrive solve quotidian arithmetic problems. In attempting to simulate these moves made in the world, different levels of interactivity were examined experimentally using a repeated-measures design where participants completed four sets of five 11 single-digit number sums the numbers composing each sum presented in random spatial configuration. Each set was completed in one of 4 conditions that varied the degree of interactivity: in one participants kept their hands palm down on a work surface and completed the sums using only their working memory resources; in a second they used pen and paper; in a third they could point to the numbers (without pen and paper); and in a fourth, referred to as the high interactivity condition, the numbers were presented as circular number tokens that could be manipulated to reconfigure the physical problem presentation (the order of the four conditions was counterbalanced across participants). Accuracy was poorest in the static hands down condition, and best in the high interactivity condition. In fact, the opportunity to reconfigure the physical presentation of the problem led to more accurate performance than in the condition where participants could point to the numbers or use a pen and paper to add them. Furthermore, thinking efficiency as gauged in terms of the ratio of the proportion of correct answers over the proportion of time invested in completing the sums was highest in the high interactivity conditions. In terms of the participants' self-evaluation of the task and their performance, the high interactivity condition promoted greater motivation, less anxiety, and a greater degree of enjoyment than in any of the other three conditions. These results suggest that interactivity in problem solving does not simply augment working memory storage, but transforms 'the terrain of cognition' (Kirsh, 2013): Participants display more efficient reasoning skills, evince more creativity, and experience a greater degree of satisfaction when completing the task.

Cultural origins of experiences with word meaning

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While in the last decades philosophers' resistance to Chomsky's approach to (knowledge of) language has diminished considerably, some have recently mounted a novel line of attack, rooted in a renewed interest in (what they call) the phenomenology and epistemology of understanding speech. I focus on the work of Barry C. Smith, a prominent representative of this approach to knowledge of language, who stresses the need for an account of speakers' first-personal, authoritative knowledge, but also argues against an epistemology of understanding disconnected from psycholinguistics, such as, arguably, McDowell's (Smith 2008, 2009, McDowell 1998). I find Smith's overall project salutary, but argue that his current elaboration of it is wanting.

Smith's take on Chomsky's position is subtle and thought-provoking. He subscribes to the arguments from the poverty of the stimuli, and to Chomsky's overall commitment to two main theses: (1) a theory embedded in psycholinguistics and developmental psychology, and (2) relying on a particular conception of language as internally represented. When it comes to his support for (2), Smith also describes the logical space of metaphysical positions about language through the alternative between (A) the idea that speakers' knowledge has something to do with properties of an external language; and (B) the Chomskian thesis that speakers' knowledge determines the properties of their internally represented language.

But Smith's interest in experiences of word meaning encourages philosophers to consider a wider variety of evidence about meta-linguistic awareness, well beyond grammaticality judgments. I argue that, when confronted with these expansive empirical results concerning our meta-linguistic awareness, his proposed account of experiences of word meaning loses its appeal.

After I summarize some phenomenological data Smith introduces, I argue that his proposals for accommodating them are dubious, and oddly, for reasons of the same kind as those he marshals against McDowell. In turn, this result suggests that especially when interested in a variety of (empirical) evidence about meta-linguistic awareness, including phenomenological data, the philosopher of language cannot consistently support both (1) and (2) above.

Indeed, when interested in a variety of evidence about meta-linguistic awareness, including phenomenological data, the philosopher of language cannot consistently support the two tenets of Chomsky's overall theory of language, i.e., that (1) theory be embedded in psycholinguistics and developmental psychology, and (2) rely on a particular conception of language as internally represented.

Furthermore, empirical research of the kind I outline should be seen as dislodging, in the epistemology of speech, the notions of language and knowledge of it, such as those included in theses (A) or (B) above, and this especially for empirically minded phenomenologists, like Smith.

I take the research in cognitive psycholinguistics to imply that the logical space outlined by the theses (A) and (B) leaves room for (at least) a third option concerning the relation between language and speakers' knowledge of it, such that elements of speakers' knowledge of language, e.g., their experiences of word meaning, are represented both internally and externally, and moreover, are strongly influenced by the cultural and/or technological environment in which speakers develop their meta-linguistic awareness.

Thinking through mind and media. The extensions of man reconsidered

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Majority of contemporary theories of communication and media studies are preoccupied by the symbolic and intentional aspect of communication and language (McQuail 2002) leaving more basic aspects of the relation between material grounds of meaning and communication unexplored. Literacy theory, Toronto school of communication and medium theory made an important contribution to examine the material dimension of media and communication (Meyrowitz 1985). Despite of this fact, Toronto School still occupy a marginal position among media scholarship. There are many reasons for neglecting the importance of this tradition (e.g. accusations of technological determinism and ethnocentrism, insufficient empirical basis etc.) (Jahandarie 1999). Contrary to common interpretations I claim that the most important reasons for rejecting the achievements of literacy theory is its ambiguous concept of technology of communication (media). It is particularly problematic whether media are to be understood as cultural practices or material artifacts. This in turn lead to simplified model of the relation between media and cognition. Common definition of the relation between mind and its tools in terms of extension, augmentation and amplification is difficult since it suggest that some external factors directly transform the passive mind and only quantitatively change the mental capacities (Cole and Griffin 1980; Theiner 2011; Pea 1985) . For instance, according to the model of extension cognitive tool such as writing contributes merely to the improvements of memory and increases the amount of information produced and processed. The other more significant qualitative changes are left unexplored (Olson 1988; Olson 1994).

The aim of the paper is to consider two general problems emerging from the discussion on literacy theory and Toronto School. First, the paper presents an argument that the conceptual vagueness of the mind – media relation is grounded in dual nature of technical artifacts which is a particular case of mind-body problem (Kroes 2010). Media as a special case of technical artifact posses at the same time intentional as well as material dimension which made extremely difficult to situate communication technologies in one coherent conceptual framework. Second, the argument is to be made that extended mind hypothesis (Clark and Chalmers 1998; Clark 2008; Dennett 1996, 2000), delivers the appropriate vocabulary for rethinking the ways of making statements about the relations between media and cognition. The extended mind framework posses however its own shortcomings: the historical and cultural dimension of the mind-media relations seems to be underestimated (Sterelny 2010; Hutchins 2010).

Human cognition: Situated or social?

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This paper takes a Cognitive Linguistic perspective on the relation between the body and the environment. Researchers in Cognitive Linguistics become increasingly interested in social and sociocultural aspects of language usage vis-à-vis human embodied experience. Since the field can be considered part of the wider domain of Cognitive Science, it is believed that relevant insights concerning the problem may have significant implications for the body/ environment issue as well.

Respectively, it must be recalled that in Cognitive Linguistics meaning is equated with conceptualisation. Thus, one question that can be posed relative to the body/environment debate vis-à-vis linguistic usage in context seems to be that of what role “thinking with hands, eyes, and things” may play in meaning negotiation, thus in establishing conceptualisations shared within a language community at the level of collective, distributed cognition. That is, inasmuch as meaning is negotiated by interacting language users, the interaction ought to be seen as facilitated by human embodiment both in its neural and extra-neural dimensions, relative to the specific sociocultural context. Most importantly, the statistical structure of human experience appears to lend a sense of an inherent order to the interaction between the human and the environment, establishing regularities, or patterns, in the body/ environment relation, thus fostering the establishment of shared conceptualisations which emerge in interaction between language users. Put differently, our Cognitive Linguistic viewpoint recognises the importance of social aspects of human cognition for situated usage. Thus, it seems necessary to address the question of interaction between human individuals in the body/ environment debate in that embodiment entails, rather than excludes, the issue of sociocultural situatedness of language users.

In conclusion, relative to the body/ environment discussion, it will be posited that these insights may presuppose a research perspective which can also address socially or socioculturally-oriented aspects of human cognition vis-à-vis their situatedness. If so, besides the concepts of embodied, distributed, extended, and situated cognition, the notion of social cognition seems to gain importance as well insofar as neural and extra-neural aspects of the human body appear to complement each other, rather than entail any clear-cut opposites.

References

- Barsalou, Lawrence (2008) Grounded Cognition, in: *Annual Review of Psychology* 2008. 59: 617–45, the article’s doi: 10.1146/annurev.psych.59.103006.093639, as of 16 July available at http://psychology.emory.edu/cognition/barsalou/papers/Barsalou_ARP_2008_ground cognition.pdf.
- Frank, Roslyn M., René Dirven, Tom Ziemke, and Enrique Bernárdez (eds.) (2008) *Body, Language and Mind. Volume 2: Sociocultural Situatedness*. Berlin-New York: Mouton de Gruyter.
- Mesquita, Batja, Lisa Feldman Barrett, and Eliot R. Smith (eds.) (2010) *The Mind in Context*, New York-London: The Guilford Press.
- Pishwa, Hanna (ed.) (2009) *Language and Social Cognition. Expression of the Social Mind*. Berlin-New York: Mouton de Gruyter.

Augustine’s Impossibly Disembodied Reason: Looking Back to Look Forward

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Philosophical and theological figures such as Plato and Augustine are blamed for denouncing flesh in favor of the soul’s purity. This is a false criticism, as neither figures blamed flesh for any of humanity’s troubles. It has been noted by many scholars in the field that western ancient and early medieval thinkers did not have a sedimented conception of the division between body and soul in the way we think of today. Rather, “dualisms” were more fluid and did not take on the onus of Good and Evil. Indeed, even evil, for Augustine, is merely a lack. For good or ill, Augustine’s conception of body/soul dualism (or, rather, the interpretations of Augustine’s conception of bo-

dy/soul dualism) has affected western thought deeply. Even Descartes' *cogito* echoes Augustine's much earlier *Soliloquies*. A discussion of past conceptions of what makes up the human individual and how that individual interacts with the world would be useful for current research on 4-E cognition as well as research on mind as a whole because these past thinkers have provided the basis for where we are now and perhaps still possess ways of discussing human cognition that are elucidating.

A problem that theories and models of mind and psychology come to again and again is the simple fact that there are other people with other experiences. There are others, and as such we are always already being formed alongside, with, and by others. Furthermore, these others are not necessarily other human minds. As Donna Haraway and others have noted, our bodies are a swirling nexus of living organisms affected by our physical environment. The theme of this conference suggests, there is more to mind than brains, and more to self than body. While it may seem "banal" to make the claim that the mind may extend outside the brain or even the body, what is not so banal is the idea that the mind is not the extent of what it is to be human. Certainly we are not homunculi riding corpses along the river of life. To be "extended" is to be fully one's body and more; to have a theory of "extension" requires a theory of mind that decenters the human from the mind/soul/brain and makes the human person into something more interesting and complicated.

In his *Soliloquies*, Augustine of Hippo attempts to get at a better understanding of God and the soul, that is, what it means to be human. He locks himself up alone and has a conversation with his own reason. However, Augustine does not finish this dialogue for that very reason—separated from his community speaking with a disembodied reason he cannot get at a better understanding of the human spirit—for mind is extended in a world of social and physical contacts. Human life that is not single and never alone. It is in this context that I will examine what the philosophy of Augustine can offer our modern questions of extension.

In this paper I will develop an account of Augustine's conceptions of the intimate connections between and self and soul, the soul and body, self and world. In the first part, I will foreground this project with a brief account of Augustine's discussion with what seems to be his own "Reason" in his *Soliloquies*. Next, I will discuss the Extended Mind thesis with regard to recent scholarship on the archeology of thought and the external modes of cognition. And finally, I will outline the corollaries between Augustine's millennia-old theory of bodily engagement with the world and thought and Extended mind. For Augustine, the self is not Soul or Mind or Body, but the constellation of flesh, thought, and spark that inhabits a physical place. This account of human beings is helpful for a better conception of mind-body-space interactions.

References

- Augustine, John E Rotelle, Kim Paffenroth, and Boniface Ramsey. *Soliloquies : Augustine's Inner Dialogue*. Hyde Park, N.Y.: New City Press, 2000.
- Augustine, and Henry Chadwick. *Confessions*. Oxford [u.a.]: Oxford Univ. Press, 1998.
- Conybeare, Catherine. *The Irrational Augustine*. The Oxford Early Christian Studies. Oxford ; New York: Oxford University Press, 2006.
- Gallagher, Shaun. *How the Body Shapes the Mind*. Oxford; New York: Clarendon Press, 2005.
- Haraway, Donna Jeanne. *When Species Meet*. Minneapolis: University of Minnesota Press, 2008.
- Jaynes, Julian. *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. Boston: Houghton Mifflin, 1990.
- The Julian Jaynes Collection*. 1st ed. Henderson, NV: Julian Jaynes Society, 2012.
- Malafouris, Lambros. *How Things Shape the Mind: a Theory of Material Engagement*. Cambridge, Massachusetts: MIT Press, 2013.

Merleau-Ponty, Maurice. *Phenomenology of perception*. London; New York: Routledge, 2002.

Nightingale, Andrea Wilson. *Once Out of Nature: Augustine on Time and the Body*. Chicago: The University of Chicago Press, 2011.

Shapiro, Lawrence A. *Embodied Cognition*. New York: Routledge, 2011.

Sleutels, Jan. "Greek Zombies."

Theoretical Controversies – Terminological Biases

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In recent literature we often encounter a kind of fallacy which is related to terminology. In my presentation, I will attempt to illuminate the terminological background of these fallacies with regard to their (often implicit) theoretical commitments. I suggest that in a representationalist frame of reference, terminological biases are hardly avoidable, and accordingly, irresolvable paradoxes remain.

Mental representation and consciousness are two concepts which, beyond the difficulties entailed by the body-mind gulf, raise at least two questions: We can ask, along with James and Wittgenstein, about how we can have a grip on them distinctly from their (supposed) physical/neural correlates and/or their expressions; and like Bergson we can ask why we need to consider "the physical and the mental as [being the] duplicate of one another". (Bergson 226)

As Pappineau noted, "[b]rain processes are standardly said to 'generate', or 'yield', or 'cause', or 'give rise to' conscious states". (11) He believes this phrasing stems from the "intuition of dualism". I will argue that this intuition inseparably relates to terminology, or more precisely to theoretical entities/constructs, which evolved with philosophical and scientific research.

Terminology suggests a causal relation between consciousness and brain states and entails fallacy in a dual sense: Beyond the familiar question of how two essentially different entities can have an impact on each other, causality, as it is tailored in accordance with mechanics, hides the difference between the mental and physical parties.

Recent research in cognitive- and neuro-science aimed at finding the neural correlate of consciousness has met with some success; and whether consciousness is related to certain parts of the brain or is rather the result of an overall brain function is under debate. The idea of emergence also arises, which suggests consciousness is not a Cartesian substance, but rather an emerging "virtual but efficacious" phenomenon. (Gallagher 116) According to a practice-oriented suggestion by Baars, we should consider consciousness as a theoretic construct and, importantly, as a variable. Baars' proposal is aimed at opening the floor to new questions unburdened with implicit dualist pre-suppositions.

If cognition is considered in an anti-representationalist and holistic brain-body-niche framework (Silberstein/Chemero), terminological biases become transparent. Instead of causal connections among brain-body-environment processes, we find dynamical relational structures (otherwise the process is under-determined); brain states, conscious experiences, and the environment (incorporating the socio-cultural setting) are equally part of the same process. Hence, the dualist phrasing cannot play a structuring role in conception-framing, but rather becomes transparent in its unfeasibility when describing phenomena.

References

- Baars, B.J. Beyond the mind-body problem: Seven testable criteria for consciousness, at <http://mbscience.academia.edu/Departments/CEO/Documents?page=4>
- Bergson, Henri 1991 *Matter and Memory*. New York: Zone Books
- Gallagher, S. 2008 *Brainstorming. Views and Interviews on the Mind*, Exeter: Imprint Academic
- Papineau, D. 2011 What Exactly is the Explanatory Gap? *Philosophia* 39, 5-19
- Silberstein, M. - Chemero, A. 2012 Complexity and Extended Phenomenological-Cognitive Systems, *Topics in Cognitive Science*, Vol. 4/1, 35-50

Abstract Representations as Material Symbols

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Several recent accounts of representation seem to suggest that there are no amodal representations in human psychology. For example, the predictive processing theory (Clark 2013) claims that brains predict future sensory input, and seems to have no place for amodal representations. Similarly, proponents of embodied neurolinguistics suggest that there is no hope for strong amodal theories of concepts (Meteyard et al. 2012; Pulvermüller 1999; Kiefer and Pulvermüller 2012).

There are several embodiment-friendly theories of abstract representations. One of them is material symbols theory (Clark 2006; Roepstorff 2008), similar to the classical account of Vygotsky (1986). According to the material symbols theory, the code for abstract representation is simply sensory representation of external symbols. The theory is explicitly endorsed by a number of other theorists who think that evidence for innate amodal symbols is scarce (Cummins and Roth 2012). Cummins and Roth claim that the language of thought is simply internalized external language. Some contemporary predictive frameworks in linguistics are committed to a similar claim (Pickering and Garrod 2012). Instead of accounting for abstract concepts in terms of their content, they focus on their vehicles. These vehicles are embodied as modal, perceptual information in the brain (not necessarily conscious). Pickering and Garrod's theory of language production and comprehension is framed in terms of forward (predictive) models.

One possible objection against this theory is that it trivializes the distinction between modal and amodal representations. Surely, words are written or spoken, and when they are, they have shapes or can be heard. Moreover, classical symbolic models used symbols from external memory, for example written in chalk on blackboards (Newell and Simon 1972). Also, even if Newell defended a physical symbols hypothesis (Newell 1980), he is not considered as a pioneer of embodied semantics, and not without reason.

The basic problem for the material symbols theory is however different. Namely, it remains utterly unclear how material symbols are supposed to refer in contrast to perceptual, modal representations. All the theory says is that they are processed by the brain in the similar way as perceptual information; but there is no answer for the question of how they are supposed to serve their representational function. The theory suggests that, strictly speaking, there are no abstract representations at all: all representations are equally concrete. However, there is (though controversial, cf. Vigliocco, personal communication) neuropsychological evidence that there is functional dissociation between systems responsible for abstract and concrete words (Shallice and Cooper 2013), in particular in the Reversed Concreteness Effect.

To sum up, although there is evidence that cultural factors (in particular, literacy) facilitate abstract thinking, it has not been shown that abstract thinking is simply sensorimotor manipulation of external symbols, and the theory seems to be simply inconsistent with experimental data about the Reversed Concreteness Effect.

From Heidegger's Hammer to Air Guitar: Understanding Music with the Body

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In his exposition on the nature of Dasein, or the experience of being, Martin Heidegger uses an example of swinging a hammer to illustrate his concept of readiness-to-hand. Stated simply, it is the way in which objects in the world present themselves to us in an ordinary manner, the kind that underlies our everyday understanding of doing something in order to achieve a specific goal. This idea of action unmitigated by reflection and mental operations will serve as the starting point for the present paper, where I will argue that musical understanding is fundamentally constituted in how listeners move to music. More to the point, the theoretical position which I advance is that actions performed to music—such as dancing, conducting, or even playing “air” instruments—are evidence of a procedural understanding of music’s temporal processes.

I first define “understanding” to mean a process that allows an agent to apply currently held knowledge to novel situations, such that the similarities between known and novel contexts provide opportunities and constraints for action. This understanding can have a linguistic basis, but, as Michael Polanyi has shown, it is rooted in tacit knowledge—knowledge that is difficult, or even impossible, to express with language. Under these conditions, procedural understanding refers to the process through which one is able to apply a series of learned actions to an unfamiliar situation. I support my claims by drawing on recent work in embodied cognition to show how such understanding constitutes the basis of the ways in which we form conceptions about our world. For example, studies have shown that children as young as 13 months—that is, before they acquire linguistic skills—understand certain material properties of objects in their environment by way of actions they can perform with them. Moreover, as argued by Hubert Dreyfus, a physical understanding of objects and events around us continues into adulthood, as we learn about the world by acting on it from our unique, first-person perspectives, and in the process of acquiring new skills through daily activities.

Based on my empirical observations of how listeners move to music, in combination with previous research on musical gestures, I will show that these actions function in a manner similar to that outlined above. From mimicking of actions necessary to produce specific sounds, through tracing sonic features like brightness or loudness, to performing abstract gestures that embody a more general musical affect, all such actions follow the temporal unfolding of music. As such, they are not automatic and involuntary re-actions, but rather constitute intentional movements, suggesting that—like gestures that accompany speech—they are indicative of, and actively shape, listeners’ thought processes. This claim is significant, because it supports a possible methodological turn in how we conceptualize music aesthetics and interpretation. More to the point, thinking of embodied responses to music as musical understanding opens the way for a conception of musical meaning that is grounded in everyday experience, especially in social contexts.

Psychological Researches Supporting a Thesis of Embodied Cognition
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For many years psychology has been researching processes concerning cognition. It examines cognition in many aspects. Chiefly, however, in frames of relatively narrow perspectives, without creating a synthesis. It has access to a large number of tests that can support different conceptions of cognition. Therefore, an attempt to define specific areas of research is always in danger of simplification. We accept this challenge and try to describe selected areas of research which, in our opinion, support a thesis of embodied cognition. We focus on four subjects which show that cognition is not only intellectual process, but also involves corporeal experience.

1. Psychological and psychoneurological examinations of brain in first half of XX century, that is, in era before neuroimaging (tests of animals, tests involving people participation). We consider a case of Zasiński, where the bullet went through the left parietal occipital area of the brain. The process of inflammation caused inflammatory changes in the adjacent brain tissue. A patient was completely lost in the world.

2. New look at psychology based on inquires of implicit cognition proving significant role of knowledge labeled by Collins as “somatic limit tacit knowledge”. These inquires bring also new knowledge concerning human activity even for psychologists themselves. According to these new results purposeful and effective activities which has been connected till now with consciousness (reflexivity) can take place even without it.

3. How emotion influences cognition: the embodied perspective. Researches on Damasio’s somatic marker hypothesis and research on posttraumatic stress disorder tell a lot about a role of emotions and corporeal experiences in cognition. In the case of PTSD tests psychological and social consequences of cortisol floods the hippocampus confirm that emotions are vital for cognition process (what results, among other things, in change of world vision, which Collins calls “tacit understanding the world”).

4. The Gibson’s conception of direct perception, undoubtedly one of most widely commented theories in contemporary cognition psychology. It assumes that external world contains all necessary informations that subject needs and that only condition for a world perception is direct discerning of data present in environment. Perception is based in motor activity, or to be more specific, coordination between motoric and others systems, visual, hearing, sensitive and gustatory ones. Knowledge enabling adaptation to environment is being created thanks to this sensory integration.

Biocultural constructivism: how culture becomes a structure of our brains.

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According to biocultural constructivism, humans are born with unique set of genes, which provide them with a variety of alternative developmental paths. Such properties of human brain as neuroplasticity affect those paths and define them due to interactions with environmental input. What we have to realize is that today most of the children have been nurtured in almost entirely human-made environments, surrounded by human-made objects (B. Wexler. 2006) and other, more intangible products of culture like art, spoken and written language, music, social rules and laws. Also caregivers educate children not only by providing them with differential sensory stimulation, but also by showing them what is relevant or not, how to interpret simple social situations and how to evaluate them, how and where to look and listen (E. Ramirez

Goicoechea. 2006). "Thus, culture determines structural selections of neuronal processes, i.e., culture becomes a structure of the brain" (E. Poppel. 2010. pp.230).

In my paper I am presenting research on effect of environmental stimulation on postnatal development of mammals (including human). There is a variety of studies showing how sensory input influence the cognitive abilities of individual. I am focusing on those, which indicate how important for proper development of entity is socio-cultural input. Moreover, I am presenting newest studies in the field of cultural neuroscience, which supports the idea that our brains are biosocial.

Literature

Chiao JY. 2010. At the frontier of cultural neuroscience: introduction to the special issue. *Soc. Cogn. Affect. Neurosci.* 5:109–10

Chiao JY, Ambady N. 2007. Cultural neuroscience: parsing universality and diversity across levels of analysis. In *Handbook of Cultural Psychology*, ed. S Kitayama, D Cohen, pp. 237–54. New York: Guilford

Han S, Northoff G. 2008. Culture-sensitive neural substrates of human cognition: a transcultural neuroimaging approach. *Nat. Rev. Neurosci.* 9:646–54

Han S, Northoff G. 2009. Understanding the self: a cultural neuroscience approach. *Prog. Brain Res.* 178:203–12

Kitayama S, Cohen D, eds. 2007. *Handbook of Cultural Psychology*. New York: Guilford

Kitayama S, Duffy S, Kawamura T, Larsen JT. 2003. Perceiving an object and its context in different cultures: a cultural look at new look. *Psychol. Sci.* 14:201–6

Nisbett RE, Peng K, Choi I, Norenzayan A. 2001. Culture and systems of thought: holistic versus analytic cognition. *Psychol. Rev.* 108:291–310

Poppel E, Bao Y. 2010. Three Modes of Knowledge as Basis for Intercultural Cognition and Communication: A Theoretical Perspective. In *Culture and Neural Frames of Cognition and Communication*, ed. S. Han, E Poppel, pp. 215–233. Berlin: Springer

Ramirez-Goicoechea E. 2006. Cognition, evolution, and sociality. In *Evolutionary Epistemology. Language and Culture. A non adaptationist systems theoretical approach.* ed. Gontier N, Van Bendegem J,P, Aerts D. pp. 283–312. Dordrecht: Springer

Wexler BE. 2010. Neuroplasticity: Biological Evolution's Contribution to Cultural Evolution. In *Culture and Neural Frames of Cognition and Communication*, ed. S. Han, E Poppel, pp. 1–Berlin: Springer

Wexler BE. 2006. *Brain and Culture: Neurobiology, Ideology and Social Change*. Cambridge, MA: MIT Press

Mental disorder, delusions and embodiment

Andrzej Kapusta

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In the presentation I will discuss some problems with a definition of the concept of health and illness. Starting with a holistic and homeostatic definition of illness (Nordenfelt, Porn) I will ask about relations between individual aims, abilities and environment and the role of the patient abilities and social environment in the diagnostic process.

The central part of the presentation I will refer to the phenomenological and embodied concepts of mental disorder. Pathological cases like hallucination and delusions may help us in explaining the role of the body and environment (physical and social) in constructing human integrity.

I will discuss some contemporary theories of psychopathology (T. Fuchs, T. Metzinger, S. Gallagher and Varela, Becker, J. Parnas, D. Zahavi) with the aim to present embodied and holistic theory of delusions.

Navigating with GPS, relatives and maps. Embodiment of sociohistorical inequalities and distributed cognition

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A goal of the paper is to explore political and social contexts of embodied and distributed cognition. On the theoretical level the paper will test possibility of merging (mutual translation) of three paradigms: word-system analysis, actor-network theory and embodied/distributed cognition. The theoretical considerations will be supplemented by a short empirical analysis concerning ways/modes of navigation in three Western African cities (Bamako, Accra, Ouagadougou). The analysis will be based on my personal experience gained in Mali, Burkina Faso and Ghana. My purpose will be to show how everyday navigational (cognitive) practises reflect a structure of global inequalities. For analytical reason I propose to distinguish three categories of space users: local citizens, tourist from the First World and tourist from the semi-peripheral (post-communist) countries. This division parallels a well-known architecture of the modern world-system as presented by Immanuel Wallerstein. My purpose will be to show how these three different sociohistorical locations are coupled with different navigation strategies, different tools (artefacts) and cognitive consequences.

I will distinguish three distributed cognitive systems/networks used to navigate in the city space:

Navigation network and artefacts	Position in the modern world-system	Main communication technology	Level of capital
use of friends and relatives	periphery (Third World)	oral communication /orality	very low
maps	semiperiphery (Second World)	literacy/ printing technology /school system	low to medium
GPS (in smartphones)	core/center (First World)	second orality and internet	high to very high

In the paper I will explain how the three different strategies are determined by a level of accumulation of capital, education and habitus of the “navigators”. I will underline that the tension between different navigational strategies, tools and “cognitive units” is linked to structural and symbolical (embodied) violence. The central thesis of the paper will be that global sociohistorical inequalities of the modern world-system are embodied in everyday cognitive situations and technical artefacts.

The Nature of thinking Thoughts
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The issue that concerns about the debate over thinking whether it is a direct awareness of object or an inferential procedure, and also whether memory presents an immediate or mediated knowledge of the past has emerged largely in philosophical discussion. The nature and function of the thinking which are normally become controversy, play a role similar to those about the function of sense data in perception. The occurrence of any of the five forms of sensory cognitive awareness instigates a reflexive mental awareness of that initial awareness. Awareness that something is blue, for example, takes place in two discrete steps-i) a simple sensory awareness without 'self-awareness' arises, followed by immediately by a mental cognitive awareness that is reflectively aware that such and such a cognitive awareness has occurred; ii) the objects cause to prompt mental cognitive awareness, thoughts, thus including reflection or thinking which arises in conjunction with mind, the faculty that supports mental cognition. Two important observations can be made at this juncture. The first is that Cognition is neither wholly subjective nor objective; means the 'subjective' sense-organs and 'objective' stimulus necessarily function in relation to, and only intelligible in terms of, each other. On the one hand, this is just common sense, and nearly tautology; of course perception is based upon our means of cognition. We can only perceive what we can discern, but what we can discern depends upon our means of perception. On the other hand, the implications of this relational view of cognition continue unfolding as we continue asking that quintessential question of 'under what conditions does discerning cognitive awareness arise'. For discerning cognitive awareness is not only an event that occurs temporally, but one which equally depends upon relational distinctions-and relational distinctions are hardly substances. Following the implications of this 'insubstantial discernment' our epistemology based dependent arising begins to get slippery indeed. The second is that Cognitive awareness is not an exact mirror of nature which reflects thing as they are. In other words all perceptions are invariably associated with an emotive element.

Through this study, I submit that all our cognitions are copies of configurations of the objects, and external objects can be known only through these copies or representative symbols. But cognitive awareness is not an exact mirror of nature which reflects thing as they are. The outline of the paper tries to scrutinize the concept of thought, and then shift the focus to cognitive awareness special reference with Buddhist philosophy. Finally, I rehearse my argument in a general discussion and end with a few remarks about the concept of thinking and thought.

References

- Amita Chatterjee. *Perspectives on Consciousness*. New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd., 2003.
- Gilbert Ryle, *On Thinking*, Oxford: Basil Blackwell, 1979.
- Gilbert Ryle, *Collected papers*, Bristol: Thoemmes Antiquarian Books Ltd., 1990.
- K. N. Jayatilleke. *Early Buddhist Theory of Knowledge*. Delhi: Motilal Banarsidass Publishers Private Limited, 2004.
- Miri Albahari. *Analytical Buddhism: The Two-Tiered Illusion of Self*. Hampshire: Palgrave Macmillan, 2006.
- Peter Harvey. *The Selfless Mind*. London: RoutledgeCurzon Tylor & Francis Group, 2004.
- Steven Collins. *Selfless Persons*. New York: Cambridge University Press, 1999.

Sensorimotor rhythms (SMR) oscillations during motor imagery and voluntary modulation. From social cognition to brain-computer interfaces

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A brief summary of current knowledge concerning the activity of the motor cortex (μ rhythms suppression) during the creation of imagery representation of movement is the aim of this presentation. The results of own research on the stimulation of imagination previously observed actions (EEG) [1] and their modification with the use of transcranial stimulation (tDCS) [2] will be demonstrated. The presented data will be interpreted in the context of contemporary research on the possibility of using this phenomenon as a marker of involvement in the social situation (MNS) [3] and the mechanism of control external effectors (Brain Computer Interfaces [4] and neurorehabilitation [5]). Particular attention will be paid to the problem of improving the control of voluntary sensorimotor rhythms through mental trainings and strategies.

Some part of the brain-computer interfaces and neurofeedback systems is based on the phenomenon highly automated (P300, SSVEP), while another is based on sensorimotoric waves, e.g., systems of ERD / ERS function thanks to a quite complex movement imagery [6]. However, due to the complexity, these systems are vulnerable to interference on the part of various mental states reflected in the EEG (i.e. distraction, decrease motivation, or inaccurate command execution) [7]. For that reason the variables that exist in current training procedures designed to control systems like BCI ERD/ERS should be taken into account.

Empirical studies available in literature do not investigate the following problem: what kind of training characteristic could be helpful in improving the effectiveness? On the one hand, the possibility of its identification may translate into a deeper understanding of the neurophysiological basis of imagery processes. On the other hand, it can enrich practical application, i.e. the possibility of developing more effective brain-computer interfaces and neurorehabilitation systems. Our preliminary results of the research on the effectiveness of training in improving voluntary modulation of ERD/ERS effect will be demonstrated during this presentation [8].

This study would have a special significance for the main group of potential recipients of such equipment, as well as for people with serious neurodegenerative disorders or acquired disability (e.g., ALS, or tetraplegia) on social background [9]. During the presentation we will try to focus more closely on the research aspect concerning the practical application of sensorimotor rhythms oscillation.

References

- Francuz, P., & Zapala, D. (2011). The suppression of the μ rhythm during the creation of imagery representation of movement. *Neuroscience letters*, 495(1), 39-43.
- Lapenta, O. M., Minati, L., Fregni, F., & Boggio, P. S. (2013). Je pense donc je fais: transcranial direct current stimulation modulates brain oscillations associated with motor imagery and movement observation. *Frontiers in human neuroscience*, 7.
- Oberman, L. M., Pineda, J. A., & Ramachandran, V. S. (2007). The human mirror neuron system: A link between action observation and social skills. *Social Cognitive and Affective Neuroscience*, 2(1), 62-66.
- Pineda, J. A., Silverman, D. S., Vankov, A., & Hestenes, J. (2003). Learning to control brain rhythms: making a brain-computer interface possible. *Neural Systems and Rehabilitation Engineering, IEEE Transactions on*, 11(2), 181-184.

- Boulay, C. B., Sarnacki, W. A., Wolpaw, J. R., & McFarland, D. J. (2011). Trained modulation of sensorimotor rhythms can affect reaction time. *Clinical Neurophysiology*, 122(9), 1820-1826.
- Neuper, C., Scherer, R., Wriessnegger, S., & Pfurtscheller, G. (2009). Motor imagery and action observation: modulation of sensorimotor brain rhythms during mental control of a brain-computer interface. *Clinical neurophysiology*, 120(2), 239-247.
- Graimann, B., Allison, B.Z., & Pfurtscheller, G. (2010) An introduction to brain – computer interface (BCI) systems, [In:] Graimann, B., Allison, B.Z., & Pfurtscheller, G. (Eds.) *Brain-Computer Interfaces: Revolutionizing Human-Computer Interaction*, Springer Publishing
- Zapała, D., Zabielska, E., Cudo, A., & Krzysztofiak, A. (2012) Desynchronization of alpha rhythm in motor imagery task after a kinesthetic training (abstract). *Acta Neurobiologiae Experimentalis*, 2 (72), 205
- Neuper, C., Müller-Putz, G. R., Scherer, R., & Pfurtscheller, G. (2006). Motor imagery and EEG-based control of spelling devices and neuroprostheses. *Progress in brain research*, 159, 393-409.

Recurrence methods in the study of human discourse.

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The dynamical shift we are observing in the cognitive sciences as a whole and in language research as a representative field therein, imposes the use of appropriate methods to analyze data and to interpret empirical evidences. Among the new analytical methods able to uncover some of the dynamic characteristics of language and conversation patterns, Recurrence Analysis (Zbilut & Webber, 1992; Webber & Zbilut, 1994, 2005; Marwan et al. 2007) is emerging as one of the most promising.

Application of Recurrence Analysis (RA) in the language field is still episodic and not well established (Leonardi, 2012), but some interesting attempts have been already implemented (Dale & Spivey, 2006; Angus et al., 2012) and we may expect more of them to emerge as a consequence of language behavior being modeled in the dynamical systems perspective.

In this contribution we aim at shortly presenting the basic concepts of RA and showing how different properties of dynamical systems may be captured by the patterns of recurrences as they emerge in recurrence plots and recurrence measures. Examples from known systems (in physical and biological sciences) will be illustrated, with special focus on multiscale phenomena. This discussion will then lead to an attempt of uncovering patterns in orthographic and syntactic structures at different levels of organization of a text (sentences, paragraphs and chapters), comparable to different time scales of the message which the text aims to convey. Further ideas of possible developments in the study of ongoing, real world conversations between two actors will be also considered.

References

- Angus D., Smith A. E. & Wiles J. (2012). Conceptual Recurrence Plots: Revealing Patterns in Human Discourse. *IEEE Transactions on Visualization and Computer Graphics*, 18(6), 988–997
- Dale R. & Spivey M. J. (2006). Unraveling the dyad: Using recurrence analysis to explore patterns of syntactic coordination between children and caregivers in conversation. *Language Learning*, 56(3)

- Leonardi G., (2012). The study of language and conversation with recurrence analysis methods. *Psychology of Language and Communication*, 16(2) 87-105
- Marwan N., Romano M.C., Thiel M. & Kurths J. (2007). Recurrence plots for the analysis of complex systems. *Physics Reports*, 438, 237-329
- Webber C. L., Jr., & Zbilut J. P. (1994). Dynamical assessment of physiological systems and states using recurrence plot strategies. *Journal of Applied Physiology*, 76, 965-973.
- Webber C. L., Jr., & Zbilut J. P. (2005). Recurrence quantification analysis of nonlinear dynamical systems. In M. A. Riley & G. C. Van Orden (Eds.), *Tutorials in contemporary nonlinear methods for the behavioral sciences* (pp. 26-94). Retrieved June 1, 2012, from <http://www.nsf.gov/sbe/bcs/pac/nmbs/nmbs.jsp>
- Zbilut J. P., & Webber C. L., Jr. (1992). Embeddings and delays as derived from quantification of recurrence plots. *Physics Letters A*, 171, 199-203.

The more I act the more I perceive – dynamics of experience in distal-to-tactile sensory substitution

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Sensory substitution (SS) devices provide participants with an information typical for one modality through other sensory input. For example, in distal-to-tactile SS, distal stimuli normally experienced through visual modality are mapped onto tactile stimuli. Here, we examine subjective experience gathered with Enactive Torch (ET; Froese et al 2012) – minimalistic distal-to-tactile SS device, which allows its user to interact with the world in natural and effortless way, i.e. enactive way. According to Froese and colleagues, ET is supposed to be transparent interface, i.e. it implicitly and directly mediates participants' goal-directed behaviour and sensorimotor interactions, without occluding the environment.

Enactive approach emphasise the role of interactions between embodied, active agent and its environment. Using ET requires such interplay, thus appears to be a proper tool for testing some enactivism assumptions concerning reciprocal, mutual constitution of action and perception. However, the questions arise. How exactly this enactive interactions work? How ET becomes transparent to its user? Is enactive interplay necessary to efficiently use ET and does it differ along conditions (e.g. due to practice)?

In order to answer these questions an experiment was conducted using both quantitative and qualitative methods. We asked 11 blindfolded participants to explore unknown experimental room using ET device and then report their subjective experience and draw a map of the environment.

Three aspects of participants' activity were taken into consideration:

1. Behavioural strategy – agent-ET interactions: static vs flexible ET use; fluency and trust in ET employment; cognitive effortful inference vs intuitive effortless experience.
2. Perceptual experience – agent-environment interactions: certainty and strategy of cognition; strategy of construing models of space; descriptions of sensory experience.
3. Efficacy (task realization) – judges' ratings of the environment maps drawn by participants; number of bumps during exploration.

All data were collected with the analysis of transcribed interviews and video recordings. We focused on dynamics of abovementioned indices.

We found that behavioural strategy indeed influences both perceptual experience and efficacy of task realization. Acquired task fluency results in more active and

flexible strategy of ET usage, allowing participants to construct richer and more exploitable models of space (whatever the form of such models would be, e.g. visual representation or a set of sensorimotor contingencies), suggesting that practice may change perceptual experience. Moreover, such enaction positively influences task realization: the more flexible action, the more accurate maps and less bumps during exploration.

Summing up, the close relationships between three aforementioned aspects of activity were identified, which seems to enable, at least partially, to infer one factor on the basis of the others. Thus, results strengthens the enactive approach assumptions confirming that action (motor behaviour) and perception (conscious experience) indeed may be taken as inseparable aspects of human's being-in-the-world and obviously impacts performance efficiency. Our findings show that sensory substitution may serve as an appropriate and fruitful way for investigations on enactive and sensorimotor approaches to cognition.

Situating science

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Historical and sociological studies have shown the importance of scientists' engagement with the material dimension of scientific practice, including external representations, tools, and the physical layout of the laboratory (e.g. Latour 1986, Pickering 1995). And yet philosophical accounts typically assume these aspects of science to be incidental to scientific reasoning itself. Although some philosophers have examined experimental practices and visual representations, most philosophical discussions assume scientific reasoning to be a matter of disembodied, logical inferences involving propositions.

This assumption is challenged by developments within situated cognitive science, which rejects the idea that thinking is disembodied symbol processing and instead stresses the role played by interactions between the mind, body and environment (e.g. Robbins & Aydede 2009). In this paper, I will explore some of the profound implications that situation cognition might have for our understanding of science. To do so, I will contrast this approach with Paul Churchland's work on the implications of connectionism for philosophy of science (1989).

Churchland argues that connectionism brings a radical change in our view of science, requiring us to abandon traditional sentential approaches in epistemology. As critics have observed (Bechtel 1996, Giere 2002), however, Churchland overlooks the crucial role that some connectionists attribute to external representations in our reasoning (e.g. Rumelhart et al., 1986). As I will show, recognising the role of external representations and other material devices in scientific practice undermines many of Churchland's conclusions regarding the implications of connectionism for philosophy of science. At the same time, however, it does not return us to traditional, sentential accounts of scientific reasoning.

Instead, I will suggest, situated cognition has far-reaching implications for many important issues in philosophy of science. For example, it asks us to rethink traditional accounts of scientific explanation and theory choice, suggesting that visual and bodily skills might play a key role in these activities. Moreover, if the material properties of representations are integral to their cognitive role, this also causes problems for existing accounts of the nature of scientific theories, which take them to be sets of propositions or abstract models. Finally, a situated approach would seem to challenge the assumption that individual scientists, or even groups of scientists, are the primary epistemic agents in science.

References

- Bechtel, W. (1996). What Should a Connectionist Philosophy of Science Look Like? In R. N. McCauley (ed.), *The Churchlands and Their Critics*. Blackwell.
- Churchland, P. M. (1989). *A Neurocomputational Perspective*. MIT.
- Giere, R. (2002). Scientific Cognition as Distributed Cognition. In Carruthers et al. (eds.) *The Cognitive Basis of Science*. CUP.
- Latour, B. (1986). Visualisation and Cognition: Drawing Things Together. In H. Kuklick (Ed.), *Knowledge and Society Studies in the Sociology of Culture Past and Present* (Vol. 6, pp. 1–40). Jai Press.
- Pickering, A. (1995). *The Mangle of Practice*. Chicago.
- Robbins, P., & Aydede, M. (eds.) (2009). *The Cambridge Handbook of Situated Cognition*. CUP.
- Rumelhart, D., Smolensky, P., McClelland, J., & Hinton, G. (1986). Schemata and sequential thought processes in PDP models. In Rumelhart et al. (eds.) *Parallel Distributed Processing*. MIT.

Reading and Enculturated Cognition: An Action-Oriented Predictive Processing Account

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Reading is an acquired cognitive skill that allows us to perform complex tasks which might be almost impossible to accomplish without relying on linguistic representations. I will argue that it is epistemically rewarding to investigate this phenomenon by combining the recently developed action-oriented predictive processing (APP) framework (e.g., Clark 2013; Hohwy 2011, 2012) with cognitive integration (CI; Menary 2007, 2012). The basic idea of APP is that human perception, action, and cognition are described in terms of multi-level, neurally realized Bayesian probabilistic generative models. The overall aim of this mechanism is to minimize prediction error, that is, to reduce the discrepancy between prior predictions and the actually given input (cf. Clark 2013; Hohwy 2011). Applied to single-word reading, it seems likely that neural activities in the ventral occipito-temporal area can be correlated with prediction errors (cf. Price & Devlin 2011). In the case of reading entire sentences or texts, my suggestion is that prediction errors and their neural correlates are associated with the estimated statistical probabilities of syntactic configurations. Active inferences are a constitutive component of APP mechanisms, as they help reduce prediction errors by arraying the environment (cf. Clark 2013; Hohwy 2011). In reading, eye movements can be construed as being a specific kind of active inference. These considerations fit nicely with Menary's (2007, 2012) theory of CI. According to CI, cognitive skills such as reading can be best described by considering the interactions between brain, body, and environment which constitute cognitive processes. This approach puts enculturated cognition center stage, which refers to the assumption that our cognitive processing capacities are transformed by our engagements with cultural artifacts, that is, by so-called cognitive practices (cf. Menary 2012). In combination with the APP framework, this idea can be cashed out by assuming that in the case of reading, there is a tight relationship between the goodness of prior predictions and the success of active inferences. This relationship is constrained both by the linguistic representations currently available in the environment and prior interactions with similar cultural material. In sum, a combination of the APP framework with CI leads to a conceptually coherent and empirically plausible approach to reading by emphasizing the mutual contribution of brain, body, and environment.

References

- Clark, A. (2013). Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behavioral and Brain Sciences*, 36(03), 181–204. doi:10.1017/S0140525X12000477
- Hohwy, J. (2011). Phenomenal Variability and Introspective Reliability. *Mind & Language*, 26(3), 261–286. doi:10.1111/j.1468-0017.2011.01418.x
- Hohwy, J. (2012). Attention and Conscious Perception in the Hypothesis Testing Brain. *Frontiers in Psychology*, 3. doi:10.3389/fpsyg.2012.00096
- Menary, R. (2007). *Cognitive integration: Mind and cognition unbounded*. Basingstoke ; New York: Palgrave Macmillan.
- Menary, R. (2012). Cognitive practices and cognitive character. *Philosophical Explorations*, 15(2), 147–164. doi:10.1080/13869795.2012.677851
- Price, C. J., & Devlin, J. T. (2011). The Interactive Account of ventral occipitotemporal contributions to reading. *Trends in Cognitive Sciences*, 15(6), 246–253. doi:10.1016/j.tics.2011.04.001

Mental health and social life

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Mental health and social life are closely inter-related. It seems essential to discuss integrative approaches such as social psychology and neuroscience to identify mechanisms of social, environmental and neuronal risk in brain. Social neuroscience, as an interdisciplinary field, focus on biological basis of social cognition that aims at exploring how social functioning may influence neuronal pathways and how brain can create social behavior.

Social deficits are common factor in many psychiatric disorders. Various social competences lack in autism, schizophrenia, bipolar disorder or borderline personality disorder. In recent years much attention has been given to the neural correlates of social cognition. This is due to the link to social functioning. Understanding the contents of other minds is crucial for development of social competence and undisturbed social cognition remains an important factor that determines fulfilling life roles, achieving independence, starting up a family etc.

After a brief presentation of social neuroscience, I will outline the need for integrative approaches that may help in understanding mental health disorders. I will focus on Schizophrenia (SZ) and Autism Spectrum Disorder (ASD), in clinical presentation of which impairment of social functioning is a cardinal feature. Although the developmental courses of SZ and ASD are quite different, recent studies that compare isolated features of both spectrum disorders suggest resemblances in the clinical phenotype. Individuals with ASD and SZ seem to share some social features. The term “social cognition” is being considered as a factor that could in some way explain the deterioration of interpersonal functioning in people suffering of AS and psychosis. However it is important to focus on biological basis of those, as well.

This paper is a review of literature related to these issues. It focus on two of the processes that underlie social cognition (theory of mind and emotion perception) and aims at exploring trends in social neuropsychology, opens some questions for future researches and shows implications for mental health.

Dewey's Phenomenology and Embodiment Theory in the Cognitive Sciences

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In working notes on cognition, Nietzsche said “start from the body.” “It is a much richer phenomenon, which allows for clearer observation.” The 20th century saw adherents to this, particularly Dewey and Merleau-Ponty, who held that hands, feet and other parts of the motor-body act as perceptual and cognitive organs. More recently, embodiment theorists in the cognitive sciences have advanced comparable views, often drawing on Merleau-Ponty. Yet few of them, strangely, have engaged Dewey's work in a sustained way. This is surprising because scholars recognize strong affinities between Dewey and Merleau-Ponty.

An article by Chemero (2013) exemplifies the tendency. In it he wrote: “Radical embodied cognitive science is an ... approach ... that combines ideas from the phenomenological tradition with ecological psychology and dynamical systems modeling.” It “is a direct descendent of the Jamesian functionalist approach to psychology.” While stressing functional psychology, Chemero made no mention of Dewey, one of its leading proponents, though Dewey anticipated Gibson's ecological psychology, and used beyond the brain approaches before Merleau-Ponty and more recent thinkers such as Thomson, Clark and Noë, who, as Solymosi (2011) said in a piece on neurophilosophy, “are barely cognizant of their similarity to Dewey.” Chemero at least mentioned Dewey in other works, but has not developed sustained discussions of him. So similarly with Rockwell in a 2005 book sympathetic to embodiment theory. “If there were such a thing as retroactive plagiarism,” wrote Rockwell, “I would gladly have accused Dewey of it,” having discovered “so many ideas that I thought were mine had been written by him almost a century earlier.” Opening with this bold statement, Rockwell went on to dedicate few sections to Dewey, and the focus was on memorable quotes rather than sustained exposition. Books by Lakoff and Johnson (1999), Clark (2008), Noë (2009) and Barrett (2011) repeat this pattern of occasional referencing without depth.

In fairness, the authors in question are not working on history of American pragmatism, so they cannot be criticized for neglecting Dewey. Still, the widespread awareness of Dewey's relevance combined with a paucity of detailed work remains troubling. My purpose, therefore, is to provide an account that will entice contemporary embodiment theorists to engage more probingly with Dewey. I will first illustrate Dewey's view that we perceive by virtue of the motor-body coordinating around worldly objects; and then show how brainless bodies can perform complex calculations and integrative operations traditionally attributed to “inner” mechanisms of mind or brain, and discuss how Dewey anticipated developments at which the cognitive science and artificial intelligence communities only later arrived. In short, I wish to demonstrate that Dewey anticipated the thesis, as Clark (2008) put it, that many “computational ... operations are implemented” through bodily action, meaning “operations are not in the neural system alone but in the whole embodied system located in the world.” Then, as a coda, I will examine how Dewey's view—which conceives of perception as an outcome of acting in the world, as opposed to representing it—supports an instrumentalist stance that undermines skeptical epistemologies that follow from “in the head” approaches to cognition favored through the Modern era and exemplified by scientists such as Dawkins.

The crisis of hands? The scientific/artistic “fabrication” of facts and artifacts

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The idea of treating hands as tools, which opens a possibility for action and thinking, has an influence on philosophical-sociological theories (Guille-Escuret 1994, 1997; Clark 2001; Varela, Thompson, Rosch 1991). It is, however, rare to include in research on cognition the practice of artists. In *The Human Condition* Arendt presents the figure of homo faber as the man, who produces stable artifacts and constructs the external world with hands by preserving the cognitive and social practice (praxis) in objects of longer duration than human life. This point of view on art, in the sense of techne, is significant in ancient times, although it has its especially strong position in the science of modern times, where discoveries “are constructed” by experiments and negotiations between scientists (Knorr-Cetina 1981, Latour 2010). The work of “hands” is delegated to objects, tools and machines (Latour 1986). Similarly to the scientific “fabrication” of facts the artistic activity has changed. The work of hands, being usually the criterion of masterpiece, has started to be depreciated along with the appreciation of conceptualization and projects instead of workmanship (Verbeek 2005, Krajewski 2010). The importance of design in art and the “delegation” of work to ordinary workers can be treated as a crisis of “hand-made”. Taking both of these aspects, enactivism seems to be a proper field for analysis of the connection between art and science (poiesis, environment). However, it is worth to ask the question whether seeking the intelligence and cognition “in hands” is a valid paradigm?

The emergence of mind from action and behavior

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Within the contemporary debate about the relationship between mind, action and behavior, we found two metaphysical assumptions that seem overwhelming: (a) the spatio-temporal world consists entirely of physical entities; and (b) an entity has no ontological status unless it has a causal influence on the world (the so called Alexander’s Dictum). Beyond, there is a stronger assumption – rooted in Hume’s analysis – about the nature of causation: (c) *this is a relationship between entities only contingently related*. This premise is so strong that it divided in an irreconcilable way the two most interesting philosophical approaches of the twentieth century. On one hand, philosophers like Davidson, Fodor, and Searle, argue that the link between mind and action is merely contingent, *given that they are causally related*. On the other, authors like Ryle, Wittgenstein, and Charles Taylor have argued that we cannot think a merely contingent (*and therefore, they say, causal*) relation between mind and action, since we would return to the Cartesian picture about a mind ontologically separated from the physical and the public domain.

Although in recent years both the enactive (e.g. Noë) and embodied (e.g. Clark) approaches have argued the same point, they claim, against the Wittgensteinian perspective, that there must be a causal relationship between mind and action allowing us to achieve satisfactory scientific explanations of people. The problem with these approaches is the lack of clear, coherent and systematic articulation of the metaphysics of mind and action: first, although they maintain a necessary mind-body link, they do

not explain it in terms of supervenience, realization or emergence, which has led to criticisms about the confusion between causation and constitution (e.g. Block and Adams & Aizawa); and second, they do not clarify the nature of the causal connection between mind and action. At this point, I will argue, the emergentist doctrine is illuminating since it articulates a causal and (nonreductive) ontological relationship between mind and action: a mental state is necessarily related with actions because it is made out of, and emerges from them. And a mental state causes a certain course of actions in a downward way, that is, *selecting* (Van Gulick) and *constraining* (Juarrero) the possibilities given in the lower behavioral level. In this perspective, the ontological and causal network in question is complex and emergent: upward (action-to-mind; e.g. from the movement of the eyes and hands to perceptions and thoughts), efficient (mental-to-mental; e.g. from one thought to another), and downward (mind-to-action; e.g. from an intention to a particular bodily movement). So, I affirm, only rejecting the (c) assumption we can reach a coherent philosophical and scientific image of the relation between mind, body and action.

Timing Together

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In my paper I would like to consider the problem of intersubjective temporality. If time is the order of internal, “mental” phenomena, then how it is possible that we share the same temporal structures and live in the same present moment? How it is possible that we synchronise these “internal” streams? One possible answer is that this “internal” time is primarily experienced in our body, it is produced by the body and as such it is bodily expressed.

First, I will introduce the idea of embodied temporality. I will describe the temporal mode of bodily feelings, and how they temporalize the flow of reflective consciousness. Then I will discuss the problem of direct perception in social cognition. I will argue that, what is directly “perceived” in other’s behaviour are amodal, rhythmical patterns, which express the other’s internal states – bodily feelings, emotions, moods. Finally I will consider intersubjective nature of embodied temporality. I will refer to the phenomenon of attunement and passive synchronisation of temporal streams.

Ontological Correlates of Visual Representations

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It is often claimed that visual representation contain propositional content that provide characteristic of a fragment of the environment – for example, we can see “that there is a red square in front of us”. Some authors even claim that for every perceptual state there is a proposition (which can be expressed in a thought) with the same representational content [1]. What is more, visual states seem to be causally related with formulating thoughts that express the content of visual representations. It additionally suggests that visual representations contain propositional content that may be conveyed by language-like structures and expressed in thought or in speech.

Visual representations usually represent spatial structures that can be described using formal ontological notions – like “parthood”, “connection” or “localization”. In that context a question can be asked about the ontological correlates of visual repre-

sentations, i.e. ontological structures of the environment that are represented by visual system and determine propositional content conveyed by different types of visual representations. By investigating them we can learn how the structure of the external world shapes the content of visual representation and also the content of thoughts that are entertained relying on visual states.

In order to identify such ontological correlates one should: (1) present a typology of visual representations in virtue of their propositional content and (2) propose an ontological characteristic of structures represented at different stages of visual process. In the presentation I sketch such a typology and ontological characteristic relying on psychological models of early vision [e.g., 2], descriptions of higher-level recognition mechanism [e.g., 3], and ontological notions formulated within the analytic metaphysics [e.g., 4].

I propose a model in which ‘visual object’ serve as a basic type of ontological structure that provides content for visual representations. Within its structure mereological relations play an important role and it possesses a diachronic sameness criterion characteristic for substratum theories of objects [5]. It serves as an ontological correlate for visual representations conveying propositional content expressed by statements containing demonstrative and predicative terms like: “This is F and is localized in L”. I show that in some cases only simpler ontological structures are represented, leading to representations with reduced propositional content like: “This is F”, or just purely existential “This is”. On the other hand, in normal conduct of the perceptual process, the ontological correlates of visual representations have more complex structure that can be adequately described by ontological substance theories of objects [6].

References

- Coates P. (2005), *The Metaphysics of Perception: Wilfrid Sellars, Perceptual Consciousness and Critical Realism*, Routledge.
- Rensink R. (2000), The Dynamic Representation of Scenes, *Visual Cognition*, 7(1-3), 17–42.
- Ullman S. (1996), Approaches to Object Recognition (Chapter 2), [in:] S. Ullman, *High-Level Vision*, MIT Press, 14-35.
- Loux, M. (1978), *Substance and Attribute*, D. Reidel Publishing Company.
- Allaire, E.B. (1963), Bare Particulars, *Philosophical Studies*, 14(1/2), s. 1-8.
- Lowe E. J. (2006), *The Four-Category Metaphysics*, Oxford University Press.

What (if anything) makes art special? On aesthetic behaviour in evolutionary aesthetics, prehistoric art and everyday life

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The “thinking with eyes and hands” idea seems to us perfectly fit various aesthetic conceptions of artistic behavior or expressive attitude in front of nature and so called everyday life. We would like to present a relatively coherent definition of an artistic-like behavior and to define its basic functions in everyday action and life (Darwin, Dissanayake, Davies et al.).

Under umbrella of evolutionary aesthetics there is so called “ethological approach” that - unlike previous interpretations of art, which defined it as a set of objects, ideas or possessions - treats art as adaptation behaviour (in bio-cultural sense).

The core question of the evolutionary approach to art - is art in its various forms a biological adaptation or should it be regarded as a modern by-product of adaptation or a cultural overlay - is challenged diversely. Pinker (2002) suggests that aesthetic sensibility is just a side effect of cognitive capacity that evolved to fill the more practical functions (such as the quest for status, aesthetic pleasure of experiencing the environment, and the ability to produce objects of practical use). Pinker, however, also allows the possibility that storytelling may have an adaptive function – it provides information about issues relevant from the cognitive point of view (Pinker 2007). Miller (2004) claims that artistic creations fulfill the function of sexual display. Brian Boyd (2009) argues that works of art are the forms of a cognitive “game”, which improves pattern recognition. Dissanayake (2000, alongside Boyd, 2009) argues that art provides a means for creating a common social identity. Dissanayake (2008, 2009), Carroll (2008), and Dutton (2009) argue that art helps to organize the human mind, because it provides aesthetically and emotionally modified forms of the relations between the elements of the human experience. The idea that art functions as a means for psychological orderliness is connected with the previous assertions (that: art provides significant cognitive information, allows for the consideration of alternative scenarios and solutions, helps in pattern recognition, and provides a means for creating a common social identity), but formulates them on a higher level of generality. Miller's hypothesis that art can be used as a demonstration of fitness (sexual display) appears to be well argued, but in this respect art would not be different from any other human products such as clothing, jewelry, beautiful buildings, and fast cars, etc. (Davies 2012, De Cruz/De Smedt 2011).

We are especially interested in applications of theoretical conceptions mentioned above to a practical (or pragmatic) dimension of contemporary art and design. As Gombrich has noted “no artist can copy what he sees” (1960) and art can be read (perceived and interpreted) in many various ways (“the beholder’s share”). The modes of reading (or reading a meaning into an image) seem to be determined by biological conditions of perception and individual psychological preferences as well. The meaning and use of images depend also on social (sometimes political) factors. Such assumptions let legitimize the infinite and open status of what is called art (it also justifies the aesthetic “bad choices” or “bad taste” by appealing to differences in evolution of human behavior and general needs).

However, as Komar and Melamid have shown in their series of decorative paintings (*The People's Choice. Most Wanted & Most Unwanted*, 1994-till now) there are some universal aesthetic preferences for chosen types of composition, objects of representation, color palettes, etc.), ruled by general human desire for the essential, some kind of order and so called beauty. Both illusory or naturalistic (or even abstract) art aims toward one idea: to make present what is needed. Its perception and understanding does not require so much education in art history, aesthetics, philosophy or psychology, etc. as rather individual experience and certain level of sensibility (Gombrich, Arasse et al.).

In conclusion of our presentation we would like to try to illustrate the evolutionary conception of human aesthetic development (treated as a form of adaptation to reality or “taming” it in the act of artistic expression and creation) by pointing some analogies between contemporary mural paintings and so called “domestic” art (decorative paintings), being essential elements of everyday-life design, and the Australian prehistoric paintings (Keep River, Arnhem Land).

Bibliography

- D. Arasse, *Le Détail. Pour une histoire rapprochée de la peinture*, Flammarion, 1992.
- D. Arasse, *Le Sujet dans le tableau. Essais d'iconographie analytique*, Flammarion, 1997.
- D. Arasse, *On n'y voit rien. Descriptions*, Denoël, 2000.
- D. Arasse, *Histoires de Peintures*, Denoël, 2004.

- B. Boyd, *On the Origin of Stories: Evolution, Cognition, and Fiction*, Harvard University Press, 2009.
- J. Carroll, *Reading Human Nature: Literary Darwinism in Theory and Practice*, SUNY Press, 2011.
- S. Davies, *The Artful Species: Aesthetics, Art, and Evolution*, Oxford: Oxford University Press, 2012.
- E. Dissanayake, *Homo Aestheticus: Where Art Comes From and Why*, Seattle 1995.
- E. Dissanayake, The arts after Darwin: does art have an origin and adaptive function? in Kitty Zijlmans & Wilfried van Damme (eds.), *World Art Studies: Exploring Concepts and Approaches*. Amsterdam: Valiz, 2008.
- J. De Smedt, H. De Cruz, A cognitive approach to the earliest art, *Journal of Aesthetics and Art Criticism*, 69 (4), 2011, p. 379-389.
- D. Dutton, *The Art Instinct. Beauty, Pleasure and Human Evolution*, Bloomsbury Press, 2009.
- E. H. Gombrich, *Art and Illusion. A Study in the Psychology of Pictorial Representation*, Phaidon Press Limited, London 1960.
- G. Miller, *The Mating Mind*, Doubleday, 2000.
- S. Pinker, *How the Mind Works*, W.W. Norton, 1997.
- S. Pinker, *The Blank Slate*, Viking, 2002.

Thinking with Hands, Eyes, Things and Others

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The primary way in which humans realize goals in the world is not through action but through co-action. Coordination with others happens through many mechanisms and on many different time-scales. Humans are prepared for co-action both by evolved, unspecific, 'synchronizing' mechanisms, which serve as a kind of 'social glue' and by more specific acculturation processes, which educate attention and action-perception for flexible interactions. In this talk I point to the types of unspecific and specific coordination in humans. Next, through the micro-analyses of early caretaker-infant interactions I show how functional, environmentally constrained structure may "sneak-into" coordination, without evoking high-level 'theory of mind' as a prerequisite.

Sense of agency in embodied action. Is this phenomenon forcing us to redefine enactivism?

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In this paper I discuss the mechanisms that are considered by some scientists and philosophers as prior to any action. This mechanism is sense of agency [SA]. I am going to evaluate and discuss the most recent theoretical models and empirical findings regarding the phenomenon of SA.

Sense of agency, by some scientists called sense of control [SC], by others strongly distinguished from SA, is a feeling of controlling one's own movements or thoughts. There is a broad discussion whether our sense of agency is determined only retrospectively – i.e., we observe the effects of our actions and when they match our intentions we feel that we are the agents acting, in such case we base on the so called

afferent signals from our body. On the other hand, there are researchers claiming that it is determined also prospectively – i.e., basing on *efferent signals*, internal and prereflective motor instructions, or selection between alternative possible actions.

I will argue that SA is a complex phenomenon, that it can be found in the basis of any action (and in many bodily movements), and that it is formed on different planes of our personal (conscious) and subpersonal (sub/non-conscious) spheres, including both retrospective and prospective mechanisms. In this undertaking I will base on theoretical deliberations and experimental data including research of pathologies of agency, such as alien and anarchic hand syndrome, obsessive-compulsive disorders etc. In the light of these studies I will re-evaluate theses of enactivism, since some experimental data suggests that sense of agency can be separated from embodied action and *vice versa*.

The research for this paper was financed by a grant to Leon Ciechanowski from the Polish Ministry of Science under the program Diamond Grant (ref. nr. DI2011008441).

The “symbol un-grounding” problem

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A bit over a decade ago, Michael Anderson (2003) characterized the project of solving the “symbol grounding” problem (Harnad 1990) as the central goal of research in embodied cognition. The goal of this project was to explain how symbolic representations of an inner “language of thought” come to acquire their meaning in virtue of being perceptually grounded in an agent’s embodied experience and physical interactions with the world. This made sense on the assumption – inherited from the tradition of classical, disembodied cognitive science which it meant to overturn – that the vehicles of higher cognition must be symbolic in order to satisfy three important criteria of concept possession: (1) representational abstraction, (2) a causal autonomy from one’s dealings with the immediate surroundings, and (3) free recombination (Weiskopf, in press).

However, for many current proponents of embodied cognition, there are no such things as amodal and arbitrary symbols inside the head (Barsalou 1999, Glenberg & Kaschak 2003, Prinz 2004, Gallese & Lakoff 2005). The high-end functionality of conceptual thinking arises, instead, from the intricate ways in which our brains co-opt the discrete, abstract, and content-bearing vehicles of public languages to tweak and sculpt, in complementary ways, the non-arbitrary, modality-rich, and context-sensitive forms of biologically more basic embodied cognition (Dennett 1996, Clark 2006, Gauker 2011, Cummins & Roth 2012). We may rightfully consider this view of language as a symbolic transformer of minds with inherently non-symbolic innards as a central part of the “reformed” symbol grounding project.

Importantly, the reformed symbol grounding project makes sense only against the assumed backdrop of a linguistic scaffold that has the properties of a *bona fide* symbol system which embodied cognition lacks. Recently, this assumption has been criticized as being part of a “language myth” (Harris 1981, Love 2004, Cowley 2011a, 2011b). For example, Steve Cowley – a co-founder and main exponent of the “Distributed Language” movement – has argued that “linguaging” is first and foremost an embodied, situated, and dialogical activity, and he adamantly “denies that language is essentially ‘symbolic’ and [...] that verbal patterns are represented inside minds (or brains).” (Cowley 2011a: 1). If Cowley and cohorts are right, this would jeopardize the reformed symbol grounding as a hybrid, “middle-of-the-road” attempt of meeting the aforementioned criteria of higher cognition, without positing anything like an internal symbolic architecture. For friends of radically embodied cognition, this may be a sign

that the suggested functional profile of “higher cognition” may itself be nothing but a myth.

Against the radicals, I defend the viability of the reformed symbol grounding project by showing in what sense human language and communication systems in general can be characterized as material symbol systems. Instead of throwing out entirely (and prematurely, I believe) the idea of languages as symbolic forms entirely, I argue that we should rather turn to a more detailed examination of the processes and conditions under which symbolic media and, derivatively, symbolic thought can emerge from non-symbolic predecessors (Logan 2007, Hutchins & Johnson 2009). I call this the “symbol un-grounding” problem. In my talk, I illustrate the significance of the symbol un-grounding problem with examples drawn from the evolution of language and writing, in particular the emergence of what Charles Hockett (1960) called the *duality of patterning*.

References

- Anderson, M. A. (2003). Embodied cognition: A field guide. *Artificial Intelligence*, 149, 91-130.
- Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, 22, 577-660.
- Clark, A. (2006). Material symbols. *Philosophical Psychology*, 19, 291–307.
- Cowley, S. J. (2011a). Distributed Language. In S. J. Cowley (Ed.), *Distributed Language*. Amsterdam: John Benjamins (pp. 1-14).
- Cowley, S. J. (2011b). Taking a language stance. *Ecological Psychology*, 23(3), 185–209.
- Cummins, R. & Roth, M. (2012). Meaning and Content in Cognitive Science. In R. Schantz (Ed.), *Current Issues in Theoretical Philosophy, Volume III: Prospects for Meaning*. Boston: De Gruyter (pp. 365-382).
- Dennett, D.C. (1996). *Kinds of Minds*. New York: Basic Books.
- Gallese, V., & G. Lakoff, G. (2005). The brain's concepts: The role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, 22, 455-479.
- Gauker, C. (2011). *Words and Images*. Oxford: Oxford University Press.
- Glenberg, A. M., & Kaschak, M. P. (2003). The body's contribution to language. In B. Ross (Ed.), *The Physiology of Learning and Motivation*, Vol. 43. San Diego, CA: Academic Press (pp. 93-126).
- Harnad, S. (1990). The symbol grounding problem. *Physica D*, 42, 335-346.
- Harris, R. (1981). *The Language Myth*. London: Duckworth.
- Hutchins, E., & Johnson, C. (2009). Modeling the emergence of language as an embodied collective cognitive activity. *Topics in Cognitive Science*, 1, 523–546.
- Hockett, C. F. (1960). The origin of speech. *Scientific American*, 203, 88-111.
- Logan, R. K. (2007). *The Extended Mind*. Toronto: University of Toronto Press.
- Love, N. (2004). Cognition and the language myth. *Language Sciences*, 26, 525-544.
- Prinz, J. J. (2004). *Furnishing the Mind*. Cambridge, MA: MIT Press.
- Weiskopf, D. (in press). The architecture of higher thought. In J. Kallestrup & M. Sprevak (Eds.), *New Waves in Philosophy of Mind*. Basingstoke, UK: Palgrave Macmillan.

Improvised interaction in embodied dyads: a mixed methods approach to *Tango Argentino*

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The cognitive mechanisms that underlie complex feats of dyadic co-regulation comprise a relatively new research topic, albeit one intriguing to several disciplines. After the developmentalist Fogel (1993, 2006), who coined the term “co-regulation”, Dynamic Systems Theory (Oullier & Kelso 2009, Passos et al. 2006, Dale et al. forthcoming, “coordination dynamics”), Ecological Psychology (Fajen et al. 2008, Rio & Warren 2012, Marsh et al. 2006, “social synergy”), Enactivism (Froese & Fuchs 2012; Froese & Gallagher 2012, “inter-enaction”, “extended body”), as well as improvisation research (e.g. Magerko et al. 2009, Maduelli & Wing 2007, Stevens & Gorman 2011) have taken up the agenda. The arguably most sophisticated and challenging interaction feats characterize skills such as pair dance, martial arts, bodywork/healing, team sports, jazz combos, etc., in which joint creativity is enabled by complex constraint sets acquired through prolonged apprenticeship. My present topic, *tango argentino*, is notable for giving rise to the proverbial “four-legged beast”, a superindividual action unit so perfectly calibrated that a leader and a follower smoothly couple with nearly zero delay, while making anticipation and planning superfluous, at least for the latter. To explain the underpinnings of tango improvisation, I present motion tracking data from 6 expert couples, complemented by micro-phenomenological interviews and think-alouds. My aim is to pinpoint counterpart connections between visual time-series data and reported sensory feedback and imagery.

First, subjective reports point to a matrix of regulative images that keep the interaction in an optimally enabling range and that lend dynamic stability to improvisation. As a counterpart to these we find *order parameters* in the biomechanic data (aka *collective variables*). These describe the organizing macroscopic patterns and invariants dancers either strive to maintain or manipulate for a task. Surveying the constraints needed for mastering dynamic tango form, it turns out that dancers simultaneously order their activity at multiple levels, spanning individual habits (“body grammar”; e.g. a good axis) and dyadic configurations (“interaction grammar”, e.g. vectors connecting the breastbones), some more permanent and others more task specific. By ensuring a handful of basic intra- and inter-body synergies dancers create an efficient and robust two-way loop of informational coupling which opens up a multitude of further improvisational possibilities.

Second, *coordination dynamics* moves into focus. I shall compare synchronization patterns over time in different couples, both of their body centers and other body parts. Successful coupling results from minimizing the delays of the torso, while requiring a substructure in the legs that is far more variable and coordinated in highly complex ways. Further measures address who in the couple controls whom informationally, hence the leader-follower structure of tango.

Third, a closer look at a short interaction slice reveals *attractor profiles* of different tango techniques, i.e. preferential states assumed for a momentary task (timescale: <2sec). I briefly discuss how attractor profiles can be used for automated identification and parsing of techniques in a project that is currently under development. Also, while any tango trajectory arises from a mix of basic step and pivot elements that are connected at “node points” their relative weights vary with the task. Although data is not yet fully available, I speculate what dynamic signatures at the micro-second scale might indicate nodes in terms of degrees of freedom.

The talk closes with reflections on research itself, notably the dialogic process whereby counterpart connections between 1st/2nd person and 3rd person data come to be recognized. Phenomenological data were “frontloaded” into a biomechanic study (cf. Gallagher 2003), but subsequently created a genuine two-way dialog.

References

- Dale, R., Fusaroli, R., Duran, N. D., & Richardson, D. C. (forthcoming). The Self-Organization of Human Interaction. *Psychology of Learning and Motivation*, 59.
- Fajen, B. R., Riley, M. A., & Turvey, M. T. (2008). Information, affordances, and the control of action in sport. *Int. J. Sport Psychol.*, 40, 79-107.
- Fogel, A. (1993). *Developing Through Relationships. Origins of Communication, Self, and Culture*. Chicago: The University of Chicago Press.
- Fogel, A. (2006). Dynamic Systems Research on Interindividual Communication: The Transformation of Meaning-Making. *The Journal of Developmental Processes*, 1, 7-3.
- Froese, T., & Fuchs, T. (2012). The extended body: a case study in the neurophenomenology of social interaction. *Phenom Cogn Sci*, 11, 205-235.
- Froese, T., & Gallagher, S. (2012). Getting interaction theory (IT) together. Integrating developmental, phenomenological, enactive, and dynamical approaches to social interaction. *Interaction Studies*, 13(3), 436-468.
- Gallagher, S. (2003). Phenomenology and experimental design *Journal of Consciousness Studies*, 10(9-10), 85-99.
- Maduell, M., & Wing, A. M. (2007). The Dynamics of Ensemble: The Case for Flamenco. *Psychology of Music*, 35, 591-627.
- Magerko, B., Manzoul, W., Riedl, M., Baumer, A., Fuller, D., Luther, K., & Pearce, C. (2009). *An Empirical Study of Cognition and Theatrical Improvisation*. Paper presented at the C&C '09 Proceedings of the seventh ACM conference on Creativity and cognition, New York, NY, USA
- Marsh, K. L., Richardson, M. J., Baron, R. M., & Schmidt, R. C. (2006). Contrasting approaches to perceiving and acting with others. *Ecological Psychology*, 18(1), 1-37.
- Passos, P., Araújo, D., Gouveia, L., & Serpa, S. (2006). Interpersonal dynamics in sport: The role of artificial neural networks and 3-D analysis. *Behavior Research Methods*, 38(4), 683-691.
- Oullier, O., & Kelso, S. J. A. (2009). Social coordination from the perspective of coordination dynamics. *R.A. Meyers. Encyclopedia of complexity and systems sciences*, 8198-8212.
- Rio, K., & Warren, W. H. (2012). *A data-driven model of pedestrian following and emergent crowd behavior*. Paper presented at the Pedestrian and Evacuation Dynamics PED 2012.
- Stevens, R. H., & Gorman, J. C. (2011). *Mapping Cognitive Attractors onto the Dynamic Landscapes of Teamwork*. Paper presented at the Foundations of Augmented Cognition. Directing the Future of Adaptive Systems, Berlin.

The body and space – conceptualisations of spatial orientation

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The embodied cognition thesis, which is one of the central claims of cognitive linguistics and was constructed to account for the structure of human conceptual organisation, postulates the claim that cognition is derived from bodily experience and this experience makes conceptual structures meaningful. Following Langacker's (1988, 2008) claims that mental processes and the general human psychical abilities and features are mirrored in language use, which were later adapted and elaborated upon by Heine (1997), the poster is an attempt to illustrate the basic conceptual patterns underlying expressions regarding spatial orientation. It is impossible to present a full picture of how this category is structured and embodied without referring to some general

principles of cognitive semantics, e.g. that human preconceptual bodily experience is represented by image schemata (Krzyszowski 1993, Evans and Green 2006), meaning is reducible to conceptualisation (Langacker 1988) or that meaning construction is a dynamic process of conceptualisation supported by the use of contextual information and background knowledge (Langacker 2008).

As the first source of preconceptual experience, the human body is the most common and significant source model for expressing spatial relations. Heine adopts Langacker's claim that "language mirrors human conceptualisation" and tries to examine the nature of several speaker-deictic locatives (i.e. 'up', 'front', 'back', 'in') in selected African and Oceanian dialects. What is interesting, although most of the underlying concepts are derived from antropomorphic model, there are also certain deictic expressions which are based on zoomorphic ones. Furthermore, he proposes a framework of conceptual development from source concept to target concept in the form of the shift from body-part to spatial concept, to corroborate some of his hypotheses about the locative potential of body-part categories. The poster integrates the results of Heine's research with some of the general principles defining the relationship between thinking and language within the embodied human experience and addresses a few questions concerning the presented problem: are the conceptualisations underlying locative markers culture-specific? Are the concepts interchangeable? Do the source concepts modify the target concepts in any way?

Heine's research on the cognitive foundations of language constitute a coherent framework that elucidates numerous context-dependent aspects that influence language. Being supported by the data from exotic languages, the theoretical considerations are confronted with the actual language-use instances of the highly embodied concept – spatial orientation.

Relationships between the personality traits, intelligence and intrinsic complexity of brain activity

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Number of recent studies present conflicting results on the relationship between Big Five personality traits, intelligence and brain activity. Conceptualizations of relation between intelligence and personality are also not very clear yet. Some researchers have suggested that the evaluation of complexity of the neuronal system can provide an additional explanation of the interaction between these three factors.

In present study we investigated the associations between the personality traits and intrinsic complexity of brain activity (defined as complexity level of EEG signal) in individuals with higher and lower intelligence.

Forty subjects (18 females) were recruited to this study. They were divided into two equal groups – depending on their level of intelligence. Group 1 contained higher intelligent individuals (HII, n = 20; 7 females). Group 2 included lower intelligent individuals (LII, n = 20; 11 females). Personality traits were assessed using the NEO-PI-R Inventory. Intelligence was evaluated using Raven's Advanced Progressive Matrices. EEG signal was recorded from 64 scalp electrodes placed in accordance with 10-10 system. Higuchi's fractal dimension was used as an index of EEG complexity level.

We found associations between personality traits and resting state brain activity (with eyes closed) in the LII and HII groups. Moreover, we found group-related differences between the particular personality traits and the values of the fractal dimension of the EEG signal sampled at different electrode locations.

Our study was supported by [1] Department of Cognitive Science and Epistemology (Institute of Philosophy of Nicolaus Copernicus University in Toruń), [2] Faculty of Humanities (Nicolaus Copernicus University in Toruń), [3] Nicolaus Copernicus University (Rector Funding).

Applications of fractal geometry to bio-signals analysis for study of fluid reasoning abilities

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Existing studies provide inconsistent or even conflicting empirical findings regarding the dependencies between the fluid reasoning abilities and electroencephalographic (EEG) signal characteristics.

Fractal geometry- and *deterministic chaos theory*-derived methods have been successfully utilized in a variety of scientific, medical and engineering applications. Dynamic shifts of the intrinsic-complexity levels on which the biological systems operate (and on which their elements interact) can be quantified by evaluation of *fractal dimension* (FD) of relevant signals directly in the time domain. These methods provide new apparatus for study of neuronal basis of the fluid reasoning abilities.

In present study we have focused on the relationship between the fluid reasoning abilities and complexity level of EEG signal in 18 young, healthy, right-handed males. Fluid reasoning abilities were measured using Raven's Advanced Progressive Matrices (RAPM). Participants were asked to relax with their eyes closed while the EEG signal was acquired from 64 scalp electrodes placed according to 10-10 international system. Higuchi's fractal dimension (HFD) algorithm was used to evaluate variations of the intrinsic-complexity incorporated in EEG signal.

We have found strong negative correlation between the performance on RAPM and HFD of the EEG signal. This suggests that brains' bioelectrical activity that is relatively richer in self-similar patterns (more deterministic or less stochastic) is associated with better fluid reasoning abilities.

Our study was supported by: Nicolaus Copernicus University in Toruń (Rector Funding); Faculty of Humanities of NCU and Department of Cognitive Science and Epistemology (Institute of Philosophy of NCU)

Video games and education: interdisciplinary project for treatment of dyscalculia

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We often hear about negative effects of playing computer games, such as aggressiveness, addiction or obesity. Nevertheless, there are number of studies which demonstrate that game-like software can be successfully used for treating children with learning impairments, such as language-based learning impairments (LLIs), dyslexia or dyscalculia. Properly designed cognitive training can bring the impaired brain activity back to the normal pattern and raise the task performance to the average level. In our poster we are going to present our proposition of how neuroscience, game design and media research can be put together in order to build effective games for educational use. Our interdisciplinary team - including cognitive science students, game designers, artists and programmers - has decided to create an unusual therapeutic game for children with dyscalculia. We have taken into account the newest research on dyscalculia, existing software and neurobiology of numerical cognition, in

particular SNARC effect. We have based on the observation that compared to ordinary computer games, the therapeutic ones are not so engaging and visually attractive. At the same time, recent studies showed it is motivation, not IQ level, that is the most important for acquiring new mathematical skills by school children. On account of this, the purpose of our team is to design a numerical game that appeals to children's motivation. In our poster we are going to illustrate the idea of maximizing motivation in computer games with selected screens from our project.

Visual scanning of figurative and abstract paintings. Research of naïve in the field of art

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Knowledge about formation of the aesthetic experience in the reception of art is still unstructured and incomplete (cf. Leder, Belke, Oeberst, & Augustin, 2004). Figurative art attempts to reflect the objects in their true forms, while abstraction is a formal composition consisting of lines, geometric shapes and color of the spots. Expert knowledge (Kapoula, Yang, Vernet, & Bucci, 2009), image content (Massaro et al., 2012) and the structure (Hekkert & van Wieringen, 1996; Locher, Krupinski, Mello-Thoms, & Nodine, 2007) modify perception of art. Among the naïve in the art criticism the verbal interpretations of artworks (including abstract paintings) dominate. They are focused on the content, the meaning of an image. Therefore, in the task of assessing artwork, due to difficulties in understanding abstract paintings (cf. Fairhall & Ishai, 2008): (H1) while watching abstract paintings naïve person will present longer average fixation time (visual material processing rate) compared to the figurative paintings. (H2) Providing information about the image will change globality/locality of visual scanning (Hristova, Georgieva, & Grinberg, 2011; Zangemeister, Sherman, & Stark, 1995). (H3) Information preparing for the reception of the image will affect the visual scan paths of participants (Holmes & Zanker, 2012). We conducted an experiment in which naïve in the arts viewed paintings made by currently creating artists. Figurative and abstract paintings were presented (none of them was previously seen by the subjects) with or without catalog description. The task was to watch the image freely and rate aesthetic experience on the scale (cf. Marković, 2012). While watching the images eye movements were measured (using SMI iView X Hi Speed). As expected,

while watching abstract paintings a lower frequency of fixations and longer average fixation times was found, than in figurative paintings. This indicates a more global visual scanning of abstract paintings. A larger number of fixations for figurative paintings may indicate greater general interest in these types of visual images. The interaction between type of images and description was found. Simple effects showed that the frequency of fixations while watching representational paintings is higher in comparison to the abstract images, but only in the case of catalog description. In further analyzes (using option of visual pathways comparison in the Ogama) fixation times in the regions of interest between people from the group with and without information were compared. The group with information showed greater similarity of the fixation times in the same regions of interest as compared to the group without information. This result may indicate a greater consistency in the process of viewing artistic images by naïve participants, when giving them the information about the artist and his paintings. Which in turn may indicate increased top-down control of visual attention (cf. Massaro et al., 2012).

An Ear for an Eye: Tension in the Media Matrix

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This paper addresses Marshall McLuhan's statement: "the ultimate conflict between sight and sound...is upon us" (1964). This conflict or tension is brought on, McLuhan claimed, by the electronic-information era and as a result of living in a 'global village.' How do visual and aural space and time complement each other and how are they in competition or tension? We explore new media and technology both as 'extensions' of man, as McLuhan called them, and also as environmental and personal 'intensions' (cf. pressures, stresses) on man. This approach highlights the effects of media and technology as ideology, politics and power and their influence on humanity. It examines the relationship between science, technology and society using an interdisciplinary methodology across natural and social sciences. It focuses on extended and embodied cognition as correctives to the 'modern' Cartesian dichotomy between *res cogitans* and *res extensa*. This can be elaborated by highlighting both the distinct and integrated usages of eyes, hands and ears via new media and technology. The paper presents both western European 'perspectives' and Eastern European 'reverse perspectives' as a way of studying how we interpret time and space, human choices and actions. The notion of trading 'an ear for an eye' is exposed in light of quantum mechanics and social networks. Thus, we bring media and technology innovation theory together in comparison with recent developments in philosophy and sociology of science. The paper elaborates one way to overcome the subjective-objective 'Cartesian cut' by making a special application of McLuhan's 'extensions of man' thesis as a 'reflexive' social science. Likewise, it draws on recent growing research in philosophy on the 'extended mind' hypothesis (Pritchard 2013, Menary 2010, Clark and Chalmers 1998) to investigate how post-evolutionary or neo-evolutionary understandings of 'human selection' are impacting human-social thought. It then considers the futuristic notion of McLuhan (1964), that "[t]he final phase of the extensions of man [is] the technological simulation of consciousness." The conclusion presents information about a new interdisciplinary, humanities multi-media scholarly project based in Vilnius, Lithuania that seeks to combine visual culture with aural culture working in collaboration with scholars particularly based in Central and Eastern Europe and also around the world.

Emotions in social science: a troublesome supplement or a convenient indicator?
Discussion about practical adaptation of emotions in research exemplified by
shame

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The dual (biological and social) nature of human feelings encourages to pose questions about their usability in the analysis of social processes. Some research from the early 80's of the last century (this refers to, inter alia, very recognized and reputed research projects of Dawid T. Kemper, Arlie Russel Hochschild, or Chris Schilling) have successfully shown that feelings can serve as a mirror reflecting social frustrations, identity conflicts or even such a broad issue as acquisition and reproduction of social norms. Today this type of (inter/abovedisciplinary) study continues on a very large scale and applies to both emotions in general as well as specific ones, such as compassion or shame (there are also some studies that offer more and more detailed categorizations of emotions distinguishing very particular feelings such as "feeling at home").

The aforementioned shame, often referred to as "moral emotion" by its researchers, was an object of a long-term research by American professor, Thomas Scheff that was later continued and challenged by many others such as L. Bradshaw, P. Hutchinson, P. Burke or S. Shott. Shame seems to be an emotion of a particular importance because of the diversity of the potential impact that it could have on an acting individual: it can contribute to building as well as destroying social bonds. The result depends on individual way of experiencing shame and a subjective or intersubjective value assigned to the object of shame for a given individual or group.

In the presentation, the author would like to propose an attempt to ponder on the specific advantages of the application of the emotion of shame (accurately operationalized) for research on issues such as social control or group identity. The aim of the presentation is also to demonstrate practical benefits of using the emotion as an indicator of social contentment, tolerance or social trust.

Non-formal science and technology. Preliminary participant observation study of
Kombinat (Fab-Lab Łódź)

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Grad./ Gdansk Polytechnic

Recent revival of makers movement might be considered as a new iteration of traditional "do-it-yourself" approach. Due to the lack of formal/non-formal translating agents, such practices are not yet sufficiently described in terms of sociology of science. Exploration of citizen technology initiatives might show how traditional black boxes (electronics, physics, electrical engineering) are firstly perceived then exploited by actors situated outside of formal structures of computational centres (laboratories, technical universities, government science system). Such study might be also a chance to observe translation between formal education actors (manuals, technical studies, theories) and non-formal networks. How to design and manufacture a sensor, a tool or a room without resources of computational centre? This poster will show preliminary results of participant observation in one of such initiatives (Fabrication-Laboratory in Lodz, Poland). Kombinat (Fab-Lab Łódź) is an ongoing project, which tries to set up a citizens' workshop. It is created as a collective localization of practice /

knowledge gathered by 3D printers, craftspersons, alternative civic engineers and IT geeks.

Author (trained as scientist / engineer) was a witness and a co-creator of this initiative. This poster will summarize observations made between January and July of 2013 during the project preparation, crowdfunding and setup. Apart from organisational activities, the poster will also present relations between Kombinat and formal structures (technical university, local authorities) in terms of sociology of Bruno Latour (Pandora's Hope circulatory science model). Poster will also show translations between formal education of founding actors and non-formal Kombinat practice.

Reading (One)Self: A Fragile and Fallible Extended Self

Przemysław Nowakowski

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May research on the extended mind tell us something interesting about self-knowledge? Is active externalism is the right framework for developing this kind of knowledge? Sometimes we think with things but do we think with things about ourselves? If literacy has changed the way we think, then to what extent may literacy influence our self-understanding?

In this paper, we intend to examine the practice of writing private journals (on such topics as dreams, memories, or recent experiences) as extended forms of introspection. In this way, we give attention to extended forms of self-knowledge by considering the practice of writing private journals on chosen examples, along with the practice of constant re-writing and re-reading own experiences. Our paper also briefly refers to the studies on the role of artifacts, the role of literacy in cognition, in particular the questions of what kind of things and what kind of interactions with these things may constitute self-knowledge, as well as the phenomenological aspects of first-person experiences of reading and writing.

We focus on the possible advantages and disadvantages implied in the practice of “reading (one)self” by reviewing classical forms of introspection from the perspective of extended cognition.

Selected sources:

Clark, A., Chalmers, D. (1998). The extended mind. *Analysis*, 58(1), 7-19.

Daudet, A. (2002). *La Douleur*. Hachette.

Dennett, D. C. (1992). The self as a center of narrative gravity. *Self and consciousness: Multiple perspectives*.

Depraz, N. (2009). The Failing of Meaning: A Few Steps into a First-Person Phenomenological Practice. *Journal of Consciousness Studies*, 16(10-12), 10-12.

Lejeune, P. (2009). *On diary*. University of Hawaii Press.

Olson, D. R. (1994). *The world on paper: the conceptual and cognitive implications of writing and reading*. Cambridge University Press.

Schwitzgebel, E. (2012). Self-ignorance, in: Liu, J., Perry, J. (Eds.). (2012). *Consciousness and the self: new essays*. Cambridge University Press.

Implicit learning study using social networks

Michał Cieśla

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Implicit learning is the learning of complex knowledge in an incidental manner, without awareness of what has been learned. It appears to be a fundamental and ubiquitous process in cognition. One of paradigm of implicit learning is sequence learning. Here it is investigated by using Serial Reaction Time task. In contrast to typical psychological experiment, the simple arcade game was implemented and put on the Facebook. By measuring peoples reactions in subsequent plays, we were able to analyze a learning process of hidden game's rules. The main advantages of such approach are the lack of player knowledge about an experiment as well as the additional motivation to do the task as best as possible to beat other players. During the talk we will present obtained results, which qualitatively agree with ones obtained from a classical psychological experiment.

Work done in collaboration with: Grzegorz Mazgaj, Jakub Barbasz and Michał Wierchoń

- [1] P.A. Frensch, D. Rünger, *Current Directions in Psychological Science* 12 13 (2003)
- [2] M.J. Nissen, P. Bullemer, *Cognitive Psychology* 19 1 (1987)
- [3] E.M. Robertson, *The Journal of Neuroscience*, 27 10073 (2007)

NOTES

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