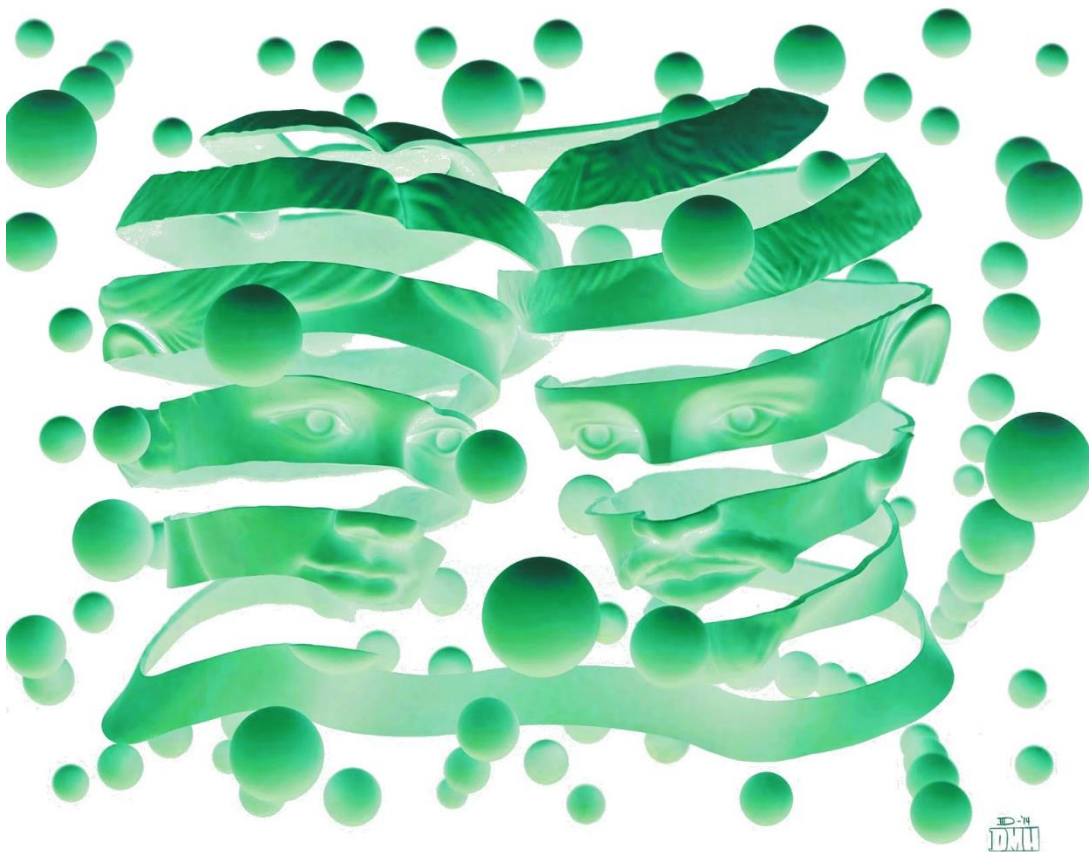


**From Self-Knowledge to Knowing Others:  
Insights from clinical populations with socio-cognitive disorders**

**Brussels, Thursday 7<sup>th</sup> of November 2019**

**Full program**



Belgian  
Association for  
Psychological  
Sciences

 **UCLouvain**

**PSYCEDUC**  
ÉCOLE DOCTORALE THÉMATIQUE  
SCIENCES PSYCHOLOGIQUES ET SCIENCES DE L'ÉDUCATION

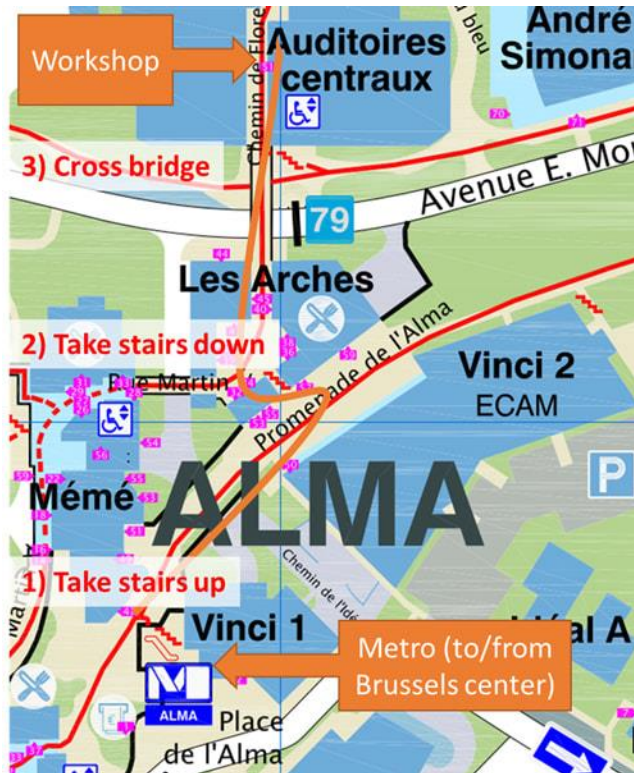
 **EDT Neurosciences**

## Schedule of the workshop – One-page version

8:30-9:00	Registration + coffee/tea + posters setup
9:00-9:30	<b>Introduction to Self-Other (mis)understanding</b> by Dr. Romina Rinaldi (UMons) and Dr. Henryk Bukowski (UCLouvain)
9:30-10:20	<b>Mentalizing self and others in borderline personality disorder</b> by Pr. Benedict Lowyck and Celine De Meulemeester (KULeuven).
10:20-11:05	<b>Relation to self and others in the addictive process: the case of alcohol use disorders</b> by Pr. Philippe de Timarty (UCLouvain).
11:05-11:25	Coffee break
11:25-12:10	<b>Nonverbal communication and its variance in autism and schizophrenia</b> by Pr. Kai Vogeley (University of Cologne)
12:10-12:40	<b>General discussion</b> with morning speakers
12:40-15:00	Lunch + Posters session (in the same room)
15:00-15:45	<b>Memory and the self concept: Neuropsychological and experimental insights</b> by Pr. Christopher Moulin (Université Grenoble Alpes)
15:45-16:30	<b>Autobiographical memories and social-cognitive functioning in individuals with substance use difficulties</b> by Pr. Jean-Louis Nandrino (Université de Lille).
16:30-17:00	Coffee break
17:00-17:45	<b>Self- and other-awareness in autism spectrum disorder (ASD)</b> by Pr. David Williams (University of Kent)
17:45-18:30	<b>On the multiplicity of mentalising impairments: insights from neuropsychology</b> by Pr. Dana Samson (UCLouvain)
18:30-19:00	<b>General discussion</b> with afternoon speakers + final words by organizers + Best Poster Award
19:00-20:30	Closure drink



## How to get to the workshop



It's 200 meters from Metro station "ALMA" (see map above)

By train: from Brussels central station: Walk to the Metro (250 m), take "**Line 1**" towards "**Stockel**", stop at "**Alma**" (12th stop, 15 min)

By train: from Brussels south/midi station : Walk to the Metro (150 m), take "**Line 6**" towards "**Elisabeth**", stop at "**Arts-Loi**" (6th stop, 7 min), then take "**Line 1**" towards "**Stockel**", stop at "**Alma**" (10th stop, 13 min).

By plane landing to Brussels Airport (Zaventem): Depending on first bus available:

Plan (A): take the bus "**659 Zaventem - Roodebeek**" (from "De Lijn" company), stop at "**Sint-Stevens-Woluwe Hippokrates**" (13th stop, 14 min), then walk for 10 min (see map below) or (to avoid walking) take the bus "**79 Krainem**" (from "Stib" company) for 2 stops, stop at "**Auditoires-UCL**".

Plan (B): take the bus "**359 Zaventem - Roodebeek**" (from "De Lijn" company), stop at "**Sint-Lambrechts-Woluwe Thiry**" (14th stop, 18 min), then walk for 16 min (see map below) or (to avoid walking) take the bus "**79 Krainem**" (from "Stib" company) for 3 stops, stop at "**Auditoires-UCL**".

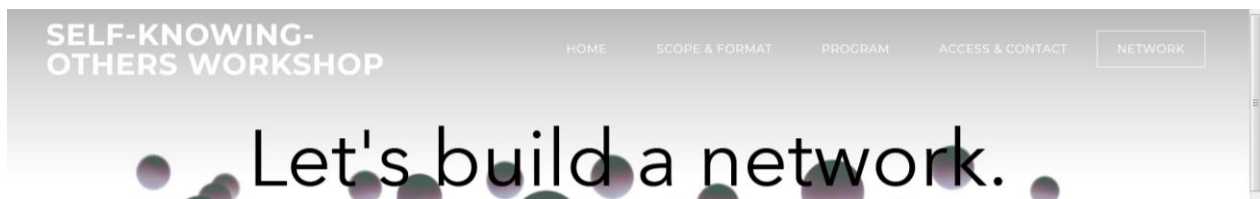
By plane landing to Brussels South Charleroi Airport: (actually located near Charleroi), take the shuttle to Brussels south/midi train station, then see above.

## Why are we here?

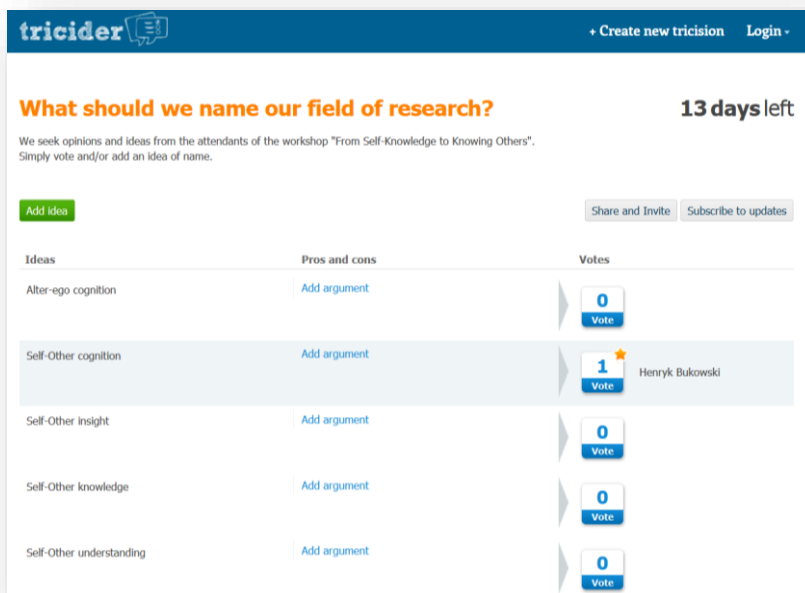
### The missing field of research:

- The mechanisms contributing to gain understanding and knowledge about *ourselves* and about *others* are two major axes of research, but studied separately
- Within each axis, the research is scattered, with distinct key words, definitions, focuses, and methods.
- There is no single field name to unite all research for each axis, and even less to unite the research bridging the two axes.

## What can you do to create the field?



- We need to create mutual awareness to realize we are not alone doing this research and we need to gather to form a community of researchers and clinicians. Go on <http://www.self-knowing-others.org/network.html> to:
  - (1) Present yourself and your research
  - (2) Report relevant literature
- We need a field name! Vote and propose names on [www.bit.ly/self2other](http://www.bit.ly/self2other)



## Schedule of the workshop – Extended version

8:30-9:00	Registration + coffee/tea + posters setup
9:00-9:30	<b>Introduction to Self-Other (mis)understanding</b> by Dr. Romina Rinaldi (UMons) and Dr. Henryk Bukowski (UCLouvain)
9:30-10:20	<b>Mentalizing self and others in borderline personality disorder</b> by Pr. Benedict Lowyck and Celine De Meulemeester (KULeuven). Chaired by Annabel Nijhof. <u>Abstract</u> : Borderline personality disorder (BPD) is characterized by difficulties in mentalizing, that is, in reflecting upon the inner mental states of both self and others. This talk will give a general introduction on BPD and the specific mentalizing difficulties associated with the disorder, followed by an overview of a current research project that investigates self-other distinction in BPD using experimental paradigms.
10:20-11:05	<b>Relation to self and others in the addictive process: the case of alcohol use disorders</b> by Pr. Philippe de Timary (UCLouvain). Chaired by Youssef Bellaali/ <u>Abstract</u> : In this presentation, I will present data arising from the literature and from our own team regarding self-knowledge and how it may explain part of the complexity of the symptomatology. Difficulties in the interpretation of acts, thoughts and intentions of others will also be described. Recent researches on a possible role of the gut microbiota and cerebral inflammation in the emergence of these social impairments will also be described. Finally, I will end up with suggestions on how to deal with these aspects practically when meeting these patients.
11:05-11:25	Coffee break
11:25-12:10	<b>Nonverbal communication and its variance in autism and schizophrenia</b> by Pr. Kai Vogeley (University of Cologne). Chaired by Haemy Lee Masson. <u>Abstract</u> : The capacity to differentiate between mental states, such as perceptions, thoughts, feelings, intentions to act, of ourselves and others and the ability mentalize or take the perspective of others are fundamental pre-requisites to successfully navigate the social world. Psychopathological symptoms including ego-psychopathology, delusions (“hypermentalizing”) often associated with schizophrenia and disturbances of interaction and communication (“hypomentalizing”) often associated with autism refer to clinical manifestations of disorders of self-other-differentiation and self-other-exchange. I will present different experimental approaches that cover perspective taking, agency, and person perception with a focus on gaze-contingent behavior and whole body motions.
12:10-12:40	<b>General discussion</b> with morning speakers, chaired by Raphae Aybar.
12:40-15:00	Lunch + Posters session (in the same room)
15:00-15:45	<b>Memory and the self concept: Neuropsychological and experimental insights</b> by Pr. Christopher Moulin (Université Grenoble Alpes). Chaired by Camille Bonnet. <u>Abstract</u> : Since the earliest cognitive characterizations of memory such as by William James or Théodule Ribot, it has been held that memory plays a critical role in the maintenance of self. More recently, Martin Conway has posited a self memory system, where episodic memory is involved in the maintenance of self concept. What is the empirical support for this memory-self relationship? I will review our studies in healthy and memory impaired groups and elucidate the role of memory in the self.

15:45-16:30 **Autobiographical memories and social-cognitive functioning in individuals with substance use difficulties** by Pr. Jean-Louis Nandrino (Université de Lille). Chaired by Luca Adolfo Tiberi.

Abstract: I propose to present different studies that characterize the functioning of autobiographical memory in individuals with substance use difficulties and show how these disorders contribute to a particular identity construction. Thus, first, I will describe 1) the processes of overgeneralization of autobiographical memories in different forms of addiction and 2) the differences in processing the semantic and episodic components of autobiographical memory both in short-term and long-term abstinent patients. Then in a second step 3) I will show how such autobiographical memory difficulties intervene in social cognitive abilities and especially in theory of mind ability, 4) in the construction of specific self-defining memories and 5) in their ability to project into the future. These results support the hypothesis of a reduction in these patients in their ability to integrate autobiographical memories explained by the use of emotional avoidance strategies, a lack of cognitive flexibility and the maintenance of the physiological effects of stress associated with negative life scripts. Different therapeutic intervention methods will be discussed on the basis of these studies.

16:30-17:00 Coffee break

17:00-17:45 **Self- and other-awareness in autism spectrum disorder (ASD)** by Pr. David Williams (University of Kent). Chaired by Melda Arslan.

Abstract: In this talk, I will consider different aspects of self-awareness in ASD (a neurodevelopmental disorder of social-communication and behavioural flexibility) and how they relate to social cognition among children and adults with this disorder. The clinical implications of findings will be discussed, as well as how the findings inform theories of the typical development and structure of self-awareness.

17:45-18:30 **On the multiplicity of mentalising impairments: insights from neuropsychology** by Pr. Dana Samson (UCLouvain). Chaired by Divyush Khemka.

Abstract: Mentalising deficits following acquired brain lesions can take multiple forms and usually result in certain aspects of mentalising being spared and other being impaired. Key profiles will be described to illustrate what brain-damaged individuals can tell us about self and other understanding.

18:30-19:00 **General discussion** with afternoon speakers, chaired by Jane Conway.

**Final words** by organizers and **Best Poster Award**

19:00-20:30 Closure drink

## Poster abstracts

## Student Reflection in an Higher-educational Context

*Milagros Saldaña*

*(1) University of Vienna, Austria; (2) University of Applied Sciences BFI Vienna, Austria*

Due to the worldwide increase of mobility and migration of students, educational institutions are becoming a microcosm of society where intercultural interaction could be a challenge. Nevertheless, they are also a place to develop skills to succeed and respond properly to the demands of our globalized society. In this line, the capacity of reflection is often presented as a crucial skill in developing students' awareness of their own cultures assumptions and openness towards other cultures and thereby, the development of intercultural competence [1], which requires affective (attitudes), cognitive (knowledge) and behavioral (skills) elements. The concept of reflection has not an agreed definition since it has many approaches at least from constructivist, enactivist and learning theories views; however, they agree in recognizing that reflection (1) requires active engagement on the part of the individual; (2) is triggered by an unusual or perplexing situation or experience; (3) involves examining one's responses, beliefs and premises in light of the situation at hand; and (4) supports the integration of new understanding into one's experience [2]. However, the role of reflection in educational contexts has not been empirically assessed thoroughly and lacks critical analysis.

Purpose:

The present research aims to identify and analyze the mentioned characteristics of reflection in a higher-education context and their correspondences to the development of intercultural competence.

Method:

The purpose will be reached from a qualitative approach by analyzing 16 semi-structured interviews which contain reflective and descriptive questions. The process will be as follows [3]: (1) the discovery phase consists of reading the data, searching for reflective processes, developing typologies and a history guide; (2) the coding phase consists on the codification and categorization of the data concerning reflection. Finally, (3) the relativization phase consists of interpreting the data considering the context in which they were collected.

Implications:

A better understanding of the role of reflection to the development of intercultural competence could support the implementation of intercultural strategies into educational curriculums which allow students to develop skills to communicate effectively and appropriately in intercultural situations.

References:

[1] D. Deardorff (ed.), *The SAGE Handbook of Intercultural Competence*. California: SAGE Publications, 2009.

[2] R. Rogers, "Reflection in Higher Education: A Concept Analysis", *Innovative Higher Education*, vol. 16, no. 1, pp. 38-57, 2001.

[3] S. Taylor & R. Bodgan. *Introduction to Qualitative Research Methods: The Search for Meaning*. New York: Wiley, 2000.



## **Reading mental states of others versus the self – the case of autism spectrum disorder**

*Katharina Bögl (1,2), Mareike Bayer (1), Isabel Dziobek (1)*

*(1) Berlin School of Mind and Brain, Department of Psychology, Clinical Psychology of Social Interaction, Humboldt-Universität zu Berlin*

*(2) Research Training Group 2386 “Extrospection. External access to higher cognitive processes”*

Mentalizing or mindreading is an important prerequisite for successful social interactions. Research suggests that there are shared neural and mental processes for mentalizing about others and the self in typically developed individuals. This supports so called one-mechanism theories which claim that the same faculty is used when mentalizing about others or the self. To further scrutinize this theory, clinical conditions with well-established deficits in inferring others' mental states can be investigated. A well-suited representative can be seen in the case of autism spectrum disorder (ASD). Affected individuals are shown to have impairments in inferring others' mental states and first evidence suggests that the access to their own mental states might be hampered, too. The study of autism may thus shed further light on the question if mindreading in self and others is a single, common process. To properly investigate this assumption, a paradigm that equally taps mindreading in self and others is required. This contribution will introduce a newly developed paradigm within this context. The suggested task addresses the inference of affective mental states in self and others during a gambling game. Behavioural results of neurotypically developed individuals with different levels of autistic traits are presented.

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## **Defining ourselves: Past and future self-defining events increase the accessibility of psychological self-concepts**

*Claudia Garcia Jimenez, Arnaud D'Argembeau*

*Psychology and Neuroscience of Cognition Research Unit, University of Liège, Belgium*

Recent research suggests that the retrieval of self-defining memories (SDMs)—the memories of the most important events in our lives—influences an individual's current sense of self and identity, notably by increasing the tendency to conceptualize oneself in relation to psychological traits. In addition to being supported by such memories, our current sense of self may also be nourished by the anticipation of meaningful future events—referred to as self-defining future projections (SDFPs). To test this hypothesis, this study examined how SDFPs and SDMs modulate the current sense of self and identity. Three groups of participants wrote a description of a SDFP, a SDM or a non-self-related control topic, following which they had to provide ten stable aspects of their identity in the form of statements beginning with “I am.” Participants engaging in SDFP and SDM descriptions generated significantly more psychological self-statements than those in the control condition. These results suggest that the act of projecting oneself into meaningful future events modulates the current sense of self to the same extent as autobiographical memory retrieval, by increasing the accessibility of psychological, trait-like self-conceptions.

## **The role of the cerebellum in social processing**

*Elien Heleven (1), Frank van Overwalle (2), Kim van Dun (3), Sarah De Coninck (4), Mario Manto (5) and Peter Marien (6)*

*(1) Psychology, Vrije Universiteit Brussel, Belgium; (2) Biomedical research institute, Universiteit Hasselt, Belgium; (3) Centre Hospitalier Universitaire Charleroi, Belgium*

An increasing number of studies highlighted the importance of the cerebellum in social functioning, most often the posterior part (i.e., Crus 1 and 2). One hypothesis states that, the basic function of the cerebellum to detect and construct internal models of sequences involving motor elements for the planning and execution of movements, extended during human evolution to the detection and construction of internal models of purely mental element which facilitates (social) event sequence processing. In order to investigate cerebellar involvement in social processing, we tested performances of cerebellar patients on social tasks involving mentalizing. We also measured brain activation in healthy subjects when performing a type of task for which patients showed impaired performances, using functional magnetic resonance imaging (fMRI). Our results reveal impairments for cerebellar patients compared to healthy controls for the Picture sequencing task which involves the generation of a correct social sequence during belief events, not for the other social tasks. Results of the fMRI study reveal posterior cerebellar involvement for an extended and verbal version of this task. We conclude that the posterior cerebellum plays a critical role in the understanding and generation of social sequence.

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## **Neural correlates of own name and own face processing in neurotypical adults scoring low versus high on symptomatology of ASD**

*Danna Oomen, Rachida El Kaddouri, Marcel Brass, Jan R. Wiersema*

*Department of Experimental Clinical and Health Psychology, Ghent University, Belgium*

*Department of Experimental Psychology, Ghent University, Belgium*

*EXPLORA, Ghent University, Belgium*

The typical enhanced P3 amplitude for self-referential stimuli, such as the own name and face, is reported to be reduced or absent in ASD. This suggests an altered psychological (own name) and physical self (own face) in ASD. However, these different aspects of self-referential processing have mainly been studied in isolation. Hence, it remains unclear whether the (absent) self-referential effect present for both stimuli can be ascribed to overlapping or distinct underlying mechanisms. We therefore investigated the neural response to the own name and face, in the same sample. We used a dimensional approach, comparing neurotypical adults scoring high versus low on ASD symptomatology ( $n_{low} = 30$ ,  $n_{high} = 30$ ). Two oddball tasks were administered (i.e. name task, face task). P3 amplitudes were larger for own name and face irrespective of groups; suggesting that an absent self-referential effect may be a categorical specifier of ASD. This finding warrants further investigation before firm conclusions can be made. Interestingly, we found no relationship between self-referential processing of own name and face, which suggests that two distinct mechanisms may underlie these effects.

## **The posterior cerebellum supports the explicit sequence learning linked to trait attribution**

*Min Pu<sup>1</sup>, Elien Heleven<sup>1</sup>, Jeroen Delplanque<sup>1</sup>, Noémie Gibert<sup>2</sup>, Qianying Ma<sup>1</sup>, Giulia Funghi<sup>3</sup> and Frank Van Overwalle<sup>1</sup>*

*1 Department of Psychology, Vrije Universiteit Brussel, Belgium*

*2 Faculty of Pharmacy, University of Montpellier*

*3 Sapienza University of Rome*

Recent research has indicated that the cerebellum is responsible for social judgments such as making trait attributions. The existing evidence on the cerebellum suggests that this part of the brain may be involved in the understanding of sequences not only of movements (anterior cerebellum) as claimed in past research, but also of social actions (posterior cerebellum). The present study investigated the function of the posterior cerebellum in supporting sequence learning linked to trait inferences about persons. We developed a memory paradigm that required participants to learn a given temporal order of six behavioral sentences that all implied the same personality trait of the protagonist. We then asked participants to infer the trait of the person and to recall the correct order of the sentences and to rate their confidence in their trait judgments and recognition accuracy. As control, a non-social sequence condition in which six sentences implied a feature of an object and a non-social non-sequential reading condition were created. While learning the correct sequence of the sentences, the posterior cerebellum (Crus II) was more activated for social trait-related sequencing than non-social object-related sequencing. Also, given a longer duration to learn the sequences, the precuneus and posterior cingulate cortex were more activated when participants attempted to retrieve the social sequences. Level of metacognitive confidence in successful retrieving the sequences modulated the posterior cerebellum (Crus I) as well as the left frontal cortex. Our findings highlight the important function of the posterior cerebellum in supporting an active process of sequencing trait-implicating actions.

## **How perspective influences eye movements during real-life conversation: A study on mentalising about self vs. others in autism**

*Mahsa Barzy, David Williams, Heather J Ferguson*

*School of Psychology, University of Kent, Canterbury, England*

Socio-communication is profoundly impaired in autism, sometimes in the absence of any language difficulties (Martin et al., 2003). Characteristic difficulties representing others' mental states (ToM) have been linked to modulations of gaze and speech in autism (Freeth et al., 2019), which are further modulated by topic of conversation (e.g. Nadig et al., 2010; Hutchins & Brien, 2016). Despite these observed impairments in 'real-world' communicative settings, research has mostly focused on lab-based experiments, where the language is highly structured. We report a pre-registered experiment, in which we recorded eye movements while participants (N=50) engaged in a real-life conversation. We tested whether gaze to social and non-social aspects of the environment differ during real-life social interaction, when autistic and non-autistic participants mentalise about the 'self' vs. a familiar other vs. an unfamiliar other (e.g. "Tell me who is your/your mother's/Marina's favourite celebrity and why?"). Results revealed that autistic participants spent less time looking at the experimenter's face, and more time looking around the background, compared to non-autistic participants. Importantly, participants spent more time looking at the experimenter's face/eyes when they were talking about themselves, compared to an unfamiliar other, but did not differ between self and familiar other. Interestingly, the unfamiliar effect was even more pronounced in autistic participants, as they spent more time fixating the background when talking about the unfamiliar other. These results suggest that perspective modulates social attention, and gaze aversion is used as a means of reducing processing costs of demanding visual social signals. There was some evidence that this effect was more pronounced in the autistic group, perhaps due to ToM impairments in autism.

## **Individual characteristics influence memory conformity and confidence in MORI task**

*Capan, Eskenazi, Gulgoz*

*(1) SOMI/Koc University/Psychology; (2) SOMI/Koc University/Psychology; (3) KURAM/Koc University/Psychology*

When people observe and later discuss an event together, they falsely integrate elements of each other's memories into those of their own. This is called memory conformity and present even when pairs of subjects observe different versions of an event while believing they watch the same one. One question that is not yet clarified is whether individual characteristics such as beliefs about memory matter in post-event incorporation of information into memory. Also, how confidence in memory is affected by post-event discussion is not known. In this study, 48 pairs of undergraduates participated in the Manipulation of Overlapping Rivalrous Images task (Gary et al., 2008). Pairs watched two versions of a film which overlapped with vertically and horizontally polarized eyeglasses and then were asked to discuss 12 details of the film which were either critical (4 that differed between the two versions) or non-critical (8 that were the same in two versions). Participants rated their confidence in the given responses, both individually and jointly, after each question. After the discussion, participants completed a recognition test individually and scales to assess individual characteristics including social anxiety, confidence in own memory, and beliefs about memory in general. The results revealed a memory conformity effect for an event that individuals believed to be shared. Individual confidence judgments did not differ for critical discussed and non-discussed questions, but they differed significantly for correctly answered and incorrectly answered critical questions showing that individuals are successful in monitoring the content of their minds. Joint confidence judgments given during discussion overall were significantly higher than individual confidence judgments given during recognition for the same critical questions, attributing joint decision-making a facilitatory role for individuals' confidence. General recognition performance was negatively correlated with social anxiety, and positively correlated with positively held memory beliefs in one's own memory. Also, social interaction anxiety was positively correlated with confidence for critical questions in discussion. The results replicated previous findings on memory conformity. It further showed that confidence in post-event discussion and recognition can be influenced by individual characteristics.

## **Self-processing in the context of the attentional blink: an EEG study in adults with ASD**

*Annabel Nijhof<sup>1</sup>, Caroline Catmur<sup>1</sup>, Geoffrey Bird<sup>2</sup>*

*<sup>1</sup>: Institute of Psychiatry, Psychology and Neuroscience, King's College London, United Kingdom*

*<sup>2</sup>: Department of Experimental Psychology, University of Oxford, United Kingdom*

Although most autism research has focused on differences in other-related processing, it has recently been suggested that self-related processing may also be different in autism. However, results across different paradigms and cognitive domains indicate that only some aspects of self-processing are diminished. One hypothesis is that differences in self-related processing only occur at later cognitive stages, but few studies have directly tested this to date.

Here, EEG was used to measure the processing of participants' own name (compared to others' names) in the context of the Attentional Blink (AB) paradigm, where names had to be detected as the second target.

So far, data for 14 adults with ASD and 17 neurotypical adults have been analysed. Behavioural results show the AB is significantly reduced for the own name (indicative of a self-processing advantage), with no group differences. Analysis at a parietal cluster shows larger amplitudes for own-name detection, for both the N2 and P3 component. Although non-significant in this sample, this self-bias is reduced on the P3 in the autism group. This is initial evidence suggesting that a difference in self-processing in autism only occurs at later cognitive stages, but this is still to be confirmed in the complete sample.

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## **Spontaneous mentalizing in children with and without ASD**

*Rachida El Kaddouri (1,3), Marcel Brass (2,3), Jan Roel Wiersema (1,3)*

*(1)Experimental Clinical and Health Psychology, Ghent University, Ghent, Belgium, (2)Department of Experimental Psychology, Ghent University, Ghent, Belgium, (3)EXPLORA, Ghent University, Ghent, Belgium*

A deficit in Theory of Mind (ToM) or mentalizing has been argued to play a causal role in the development of social difficulties in individuals with ASD. Although they seem to pass explicit mentalizing tasks, it has been argued that they suffer from a specific impairment in spontaneous mentalizing. Our main objective was to investigate spontaneous mentalizing in children with and without ASD. We used an adjusted version of the original ball detection

paradigm of Kovács, Téglás and Endress (2010), the Buzz task, in which the timings for all conditions were equalized, ruling out any potential timing confounds (El Kaddouri et al., 2019). This paradigm allows us to investigate how reaction times are affected by their own belief (self-bias) and by the belief of an agent (other-bias), hence giving us an implicit measure of mentalizing. The results indicate that children have a strong self-bias, they responded significantly faster in conditions in which they have a positive content belief. Concerning the other-bias, the effect was marginally significant. No group differences were

found for these effects. However, children with more ASD symptoms showed worse spontaneous mentalizing, warranting further investigation.

## **Reduced task-dependent modulation of functional network architecture for positive versus negative affective touch processing in autism spectrum disorders**

*Haemy Lee Masson (1,2), Hans Op de Beeck (1), Bart Boets (2)*

*(1) Brain and Cognition, KU Leuven, Belgium; (2) Center for Developmental Psychiatry, KU Leuven, Belgium*

Individuals with autism spectrum disorders (ASD) experience impairments in social communication and interaction, and often show difficulties receiving and offering touch. Despite the high prevalence of abnormal reactions to touch in ASD and the importance of touch communication in social life, the neural mechanisms underlying atypical touch processing remain largely unknown. To answer this question, we provided both pleasant and unpleasant touch stimulation to adults with and without ASD during functional neuroimaging (fMRI). By employing a generalized psychophysiological interaction (gPPI) analysis combined with an independent component analysis (ICA) approach, we characterize context-dependent changes in functional connectivity patterns for processing two tactile stimuli that evoke different emotions (i.e. pleasant vs. unpleasant touch). Results reveal that neurotypical adults showed extensive context-sensitive modulations of the functional network architecture in response to different types of touch, both at the level of individual brain regions and at the large-scale network level. Conversely, much less context-sensitive modulations was observed in the ASD group. In particular, these aberrant functional connectivity profiles for processing affective touch are marked by hypoconnectivity of the somatosensory cortex and the salience network. The current study suggests that the reduction of context-related changes in functional network architecture for processing pleasant versus unpleasant touch may be associated with abnormal reactions to touch in ASD.

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## **Implicit sequence learning in social context: A pilot study**

*Qianying Ma, Frank Van Overwalle, Elien Heleven, Min Pu*

*Vrije Universiteit Brussel*

Learning regularities in a social environment can facilitate understanding of social behavior and interactions with other people. In dynamic social interactions, people have to update their representations of other's mental states continually. In order to investigate whether people could learn sequences of others' mental states in an implicit manner, we attempted to create a new sequencing task, combining elements from serial reaction time tasks and false belief tasks. In this task, participants must have the understanding that the protagonists hold mental beliefs about the reality that they can see (true beliefs) or about the reality that they saw earlier (false beliefs). Unbeknownst to participants, pseudo-random sequences of true and false beliefs by protagonists, and the location of targets on screen, were embedded in the task. Participants are expected to implicitly learn sequences of true and false beliefs related to each protagonist, and also of the locations of the flowers. The present analysis demonstrates that implicit social sequence learning is possible in the absence of confounding motor responses (by asking "how many" flowers rather than "where"). Moreover, participants implicitly learned a sequence of true and false beliefs on false trials; and of the flowers' location on true trials. Thus: implicit sequence learning seem to occur only when relevant for task performance.

## **Understanding self-processing in ASD: a neurocognitive approach**

*Letizia Amodeo (1), Annabel Nijhof (2), Marcel Brass (3), Jan Roeljan Wiersema (4)*

*(1) Department of Experimental, Clinical and Health Psychology, Ghent University, Ghent, Belgium*

*(2) King's College London, London, Great Britain*

*(3) Department of Experimental Psychology, Ghent University, Ghent, Belgium*

*(4) Department of Experimental, C*

Individuals with ASD experience difficulties in social interaction and communication on a daily basis. These social difficulties influence reciprocal communication and the understanding of emotions and intentions of others. A considerable amount of research focused on other-related information processing, as this seems to be compromised in individuals with ASD. Recent findings provide evidence for impairments in self-related information processing as well. While neurotypical individuals tend to preferentially process information, which is relevant for the self, individuals with ASD show a smaller – or even absent – self-bias. Yet, further research is needed to identify what features of self-processing might be specifically dysfunctional in ASD, and what their neurobiological underpinnings are. In order to deepen and extent our knowledge about this issue, our project aims at understanding the temporospatial characteristics of self-processing in individuals with ASD, by using neurocognitive techniques, such as functional Near-Infrared Spectroscopy (fNIRS) and Electroencephalography (EEG). Our foremost goals are investigating how different aspects of self-referential processing might differ in ASD compared to a non-clinical population, how these may be linked to social impairments and finally providing clinicians with a more robust theoretical background in order to improve existing as well as novel treatments.



## **Horses gender (*Equus caballus*) influences facial expressions in an interspecific communication**

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In humans, facial expressions (FE) represent an important communicative tool (Rachael et al, 2015). Previous studies in humans show differences between genders in expression and recognition of emotional FE (Tanja et al, 2018). Women reacted faster and more precisely than men, depending of the emotion observed. A possible origin to that difference could be the social education or culture but could also be innate mechanisms (Tanja et al, 2018). To study facial expressions in horses is interesting because it could contribute to understand the cultural factors on FE.

Like humans, horses (*Equus caballus*) have a complex social life including “fission-fusion” dynamics (Wathan et al, 2015). Yet, it’s still debated as they’re organized in a “harem” structure (Renana et al, 2018). But horses use to live in small stable groups which could aggregate in larger herds or separate (Waring, 2003). These “fission-fusion” dynamics have been described first in non-human primates (Kummer, 1971) and then extended to humans. Today, these social systems have been observed in dolphins, elephants or bats ... (Aureli et al, 2008). This allows to build more relations between conspecifics and require to develop complex abilities of communication (Hinde, 1983).

Based on the EquiFAC system (Wathan et al, 2015), we analyzed facial expressions on 14 horses, 7 females and 7 males, in an interspecific context of communication (with a human experimenter). Our results suggest that FE in horses could have a communicational content. Like in humans, we also found a difference of expression between mares and geldings. And so, in their general facial expression and the kind of FE they used.

To our very best knowledge, it’s the first time that such gender influence on facial expression have been explored on non-human animals. Our results could suggest that the FE gender differences are not only culturally determined.

## **Horses (*Equus caballus*) adapt their behaviour to human attentional states**

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Socio-cognitive competencies are paramount factors for successful interindividual interactions. The perception of self and others, the inference of intentions and beliefs of another, the prediction of behavior and reactions of a third party are key aspects of social cognition. Theory of mind (ToM) is usually seen as a high-level cognitive process involving the ability to attribute mental states to others (Premack & Woodruff, 1978). Whether this cognitive skill is specific to *Homo sapiens* or whether it is shared with others animal species is quite not so clear.

To attribute goals and intentions to others require to understand the attentional states of others and the direction of their attention. In humans, attention is linked to body orientation, gaze and general posture (Nummenmaa & Calder, 2008). Studies have shown that non-human animals, as jackdaws, parrots, dogs or dolphins, can recognize some cues of attentional states of humans (von Bayern & Emery, 2009; Péron et al., 2010; Call et al., 2003; Tomonaga, 2010). Horses can make a difference between body orientations of humans (Proops & McComb, 2010). But, to our very best knowledge, no study investigated how horses communicate according to the different attentional states of the human experimenter.

25 horses have been recorded and their behavioral patterns were analyzed in two controls and seven test conditions. Among all the movements expressed, only a set of them have displayed a high occurrence. Some of them are differently expressed according to the experimenter body and head orientation and attentional states (attentive/inattentive, eyes closed/opened). Yet, it appears that horses attribute their own visual field to the experimenter (horses: 200° per eye, humans: 150° per eye, Murphey et al., 2009).

Our results suggest that horses could differentiate at least some attentional cues of humans.

## **Do Differences between Self- and Spouse-Evaluation of Memory Performance Signal Incipient Anosognosia and Predict Cognitive Decline in Healthy Older Adults?**

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**Introduction:** Alzheimer's disease (AD) begins with slight memory and cognitive impairment, years before dementia onset. AD patients often suffer from anosognosia, being unaware of their cognitive deficits or tending to minimize them. However, it is unclear when this symptom first appears in the development of the disease. In this retrospective study of non-demented older adults, we investigated an index comparing the evaluation of participants' cognitive performance by themselves and by their spouses as a surrogate marker of incipient anosognosia

**Methods:** In a cross-sectional analysis of data collected in 2005 from 5945 participants in the Wisconsin Longitudinal Study (average age 64, 54% male), we computed a discrepancy score between the evaluation of the participant's cognitive abilities by his or her spouse and by each participant himself or herself to establish an anosognosia score (AS). A negative AS was interpreted as a sign of anosognosia. In longitudinal analyses, we compared changes in objective cognitive performance between 2005 and 2011 as a function of AS in 2005.

**Results:** The anosognosic participants were slightly older (64.6 vs 63.8 years old;  $p = 0.001$ ), more likely to be male (84%;  $p < 0.0001$ ), and had a lower high school IQ (100.3 vs 103.8  $p < 0.001$ ). Anosognosia significantly predicted lower immediate and delayed recall performance in 2005, independently of demographic factors ( $R^2$  adjusted = 9.3%;  $p = 0.0001$ ). Moreover, anosognosia was predictive of subsequent decline in memory and cognition ( $R^2$  adjusted = 0.044  $p = 0.004$ ), independently of demographic factors such as age, sex, education and genetic status of APOE, a well known risk factor of Alzheimer disease.

**Discussion:** Cognitively normal older adults who tended to overestimate their cognitive performances have poorer memory and are more prone to cognitive decline six years later than cognitively normal older adults who accurately estimate or underestimate their cognitive abilities.

## **The effect of TMS to the right temporoparietal junction on self-other empathic processing**

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A core component of successful social interaction is the ability to control mental representations of self and those elicited by others. While humans typically use a self-referential projection mechanism to perceive other people's mental states, an inability to effectively switch between competing self-other representations according to situational demands may contribute to egocentric judgements of social information. The low-level cognitive process responsible for switching between self and other representations, termed self-other control, is implicated in higher order processes such as theory of mind, perspective-taking and empathy. Current neuroscientific evidence suggests the involvement of the right temporoparietal junction (rTPJ) in self-other control of imitative responses and theory of mind with reasonable consensus. However, the evidence for rTPJ involvement in self-other empathic processing is debatable. The current study aims to directly test the hypothesis arguing for the involvement of rTPJ in self-other empathic processing with a transcranial magnetic stimulation (TMS) paradigm.

Using a within-subjects design, participants will be provided 40 seconds of theta-burst TMS to either the rTPJ or the vertex (control site) on day 1. Participants will then perform the imitation-inhibition task (indexing self-other control) and the pain observation task (indexing empathic responses to painful vs non-painful stimuli). The imitation-inhibition task also indexes spatial compatibility, acting as a non-social control measure. Similarly, the pain observation task indexes responses to social vs non-social stimuli, providing us a non-social control measure. The control measures will test whether TMS to the rTPJ is influencing social processing exclusively. The same procedure as day 1 will be repeated a week later with stimulation provided to the remainder brain site, followed by the identical tasks. The interaction between empathic responses to painful versus non-painful stimuli across the two brain sites will reveal if the rTPJ is involved in self-other processing in the empathy domain.

## **Reduced neural categorization of angry and fearful faces in boys with autism**

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Being able to quickly read faces and facial expressions is crucial for successful everyday social interactions. However, it is often a struggle for many individuals with autism spectrum disorder (ASD), who are characterized by impairments in social communication and interaction, including deficits in socio-emotional reciprocity and deficient non-verbal communicative behaviour.

Considering the abundant mixed behavioral results on emotion processing in ASD, we combined fast periodic visual stimulation (FPVS) with frequency-tagging electroencephalography (EEG) to examine the implicit neural sensitivity of school-aged boys with ASD versus matched controls to brief changes in facial expression. By periodically presenting neutral faces at 6 Hz base rate and expressive faces (angry, fearful, happy or sad) at 1.2 Hz oddball rate and by quantifying the periodic brain response at the oddball frequency, we determined the implicit neural sensitivity for expressive face detection.

While both groups show equal neural synchronization to the general face stimulation and similar neural responses to happy and sad faces, we found that boys with ASD show significantly reduced neural responses to rapid changes in angry and fearful facial expressions, as compared to controls. These results suggest a rather specific emotion detection deficit in ASD instead of a general deficit: boys with ASD are less sensitive than typically developing boys to rapidly and implicitly detect angry and fearful faces. Furthermore, at the individual subject level, these neural differences allow to predict membership of the ASD-group with an accuracy of 87%. The fast, straightforward and implicit nature of FPVS-EEG opens new perspectives for supporting clinical diagnosis.

## **Understanding How Minds Vary Relates to Skill in Inferring Mental States, Personality, and Intelligence**

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Using a 'theory of mind' allows us to explain and predict others' behaviour in terms of their mental states, yet individual differences in the accuracy of mental state inferences are not well understood. We hypothesised that the accuracy of mental state inferences can be explained by the ability to characterise the mind giving rise to the mental state. Under this proposal, individuals differentiate between minds by representing them in 'Mind-space' – a multidimensional space where dimensions reflect any characteristic of minds that allows them to be individuated. Individual differences in the representation of minds and the accuracy of mental state inferences are explained by one's model of how minds can vary (Mind-space), and ability to locate an individual mind within this space. We measured the accuracy of participants' model of the covariance between dimensions in Mind-space that represent personality traits, and found this was associated with the accuracy of mental state inference (Experiment 1). Mind-space accuracy also predicted the ability to locate others within Mind-space on dimensions of personality and intelligence (Experiment 2). Direct evidence for the representation of minds in mental state inference was obtained by showing that the location of others in Mind-space affects the probability of particular mental states being ascribed to them (Experiment 3). This latter effect extended to mental states dependent upon representation of trait covariation (Experiment 4). Results support the claim that mental state inference varies according to location in Mind-space, and therefore that adopting the Mind-space framework can explain some of the individual differences in theory of mind.

## **Confidence affects integration of social feedback and subsequent decision change**

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What others think influence our behaviour causing an adjustment in our decisions (e.g. Ash, 1956; Cialdini & Goldstein, 2004). In line with this, we recently demonstrated that people automatically align their metacognitive evaluations (i.e. confidence) as a function to the information provided by nonverbal social cues, even when these cues were non-informative and were to be ignored (Eskenazi et al., 2016). However, little is known about the ways in which metacognitive evaluations of past decisions (i.e. decision confidence) affect the way we process social feedback. In a previous study we demonstrated that the neural response to subjective opinions changes as a function of how confident one is about a previous decision (Eskenazi et al., in prep.). Here using the same experimental paradigm we demonstrate how this relationship between metacognitive evaluations and subjective opinion leads to a change in decision (i.e. conformity).

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## **Investigating attention to social stimuli in real world in Younger vs. Older adults**

*Martina De Lillo, Victoria Brunsdon, Elisabeth Bradford, Matt Fysh & Heather Ferguson*

*University of Kent*

Successful and meaning social interactions represent a crucial aspect of our everyday life. Previous findings have found aging differences in how we communicate in the real world. Using a real-world methodology (eye-tracking glasses), we compared social interactions and social attention in young (20-40 yo) vs older adults (60-80 yo). In Experiment 1, participants engaged in a short interview-style conversation with the experimenter. In the first speaking part they answered four questions, in the second listening part they switched roles with the experimenter and now asked four questions and listened to the experimenter's answers. Eye-tracking monitored looks to the experimenter's face, body, and background. In Experiment 2, participants completed a task that required a short walk outside the lab. They were provided with a map that indicated the route to follow, and eye-tracking monitored looks to people, objects, path, and map. Results from Experiment 1 showed that participants spent more time looking at the background while speaking, but longer looking at the experimenter's face features while listening, and overall, older adults spend more time looking at the background compared to face features. While navigating the real-world in Experiment 2, participants spent surprisingly little time fixating people, and this was significantly reduced among older adults compared to young adults. Correlational analyses were run to investigate whether there exists a relationship between MoCA scores and social attention, but no significant correlations were found.

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**We wish you a pleasant and instructive workshop!**

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