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Implicit body perception at the Pelvic Girdle with the two-point estimation task: a reliability study

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BACN
British Association for Cognitive Neuroscience

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

12th and 13th September 2023
Royal Welsh College of Music & Drama, Cardiff

North Road, Cardiff CF10 3ER

Programme overview

Tuesday 12th September

8.30am	9.20am	Registration and Welcome
9.20am	11.00am	*Symposium 1: Affect-driven Learning and Information Seeking*
11.00am	11.30am	Break
11.30am	12.15pm	*Individual presentations 1 (3 speakers)*
12.15pm	12.45pm	*Datablitz presentations 1 (10 speakers)*
12.45pm	2.30pm	Lunch & poster session
2.30pm	3.30pm	*Individual presentations 2 (4 speakers)*
3.30pm	4.00pm	Break
4.00pm	4.45pm	*2022 early-career prize: Jennifer Cook*
4.45pm	5.30pm	*2023 early-career prize: Freek van Ede*
7pm	late	BACN 2023 Social event (tickets available during registration) (Revolution, 9-11 Castle Street, CF10 1BS)

Wednesday 13th September

8.30am	9.00am	Registration
9.00am	10.40am	*Symposium 2: Constructing Reality: Neurocognitive Mechanisms of Non-veridical Perception*
10.40am	11.15am	Break
11.15am	12.00pm	*Individual presentations 3 (3 speakers)*
12.00am	12.30am	*Datablitz presentations 2 (10 speakers)*
12.30pm	2.00pm	Lunch & poster session
1:30pm	2.00pm	AGM
2.00pm	3.40pm	*Symposium 3: From Cognitive Neuroscience to Empirical Aesthetics and Back Again*
3.40pm	4.15pm	Break
4.15pm	5.00pm	*2023 mid-career prize: Jie Sui*

THANKS TO THE GENEROUS SUPPORT OF OUR SPONSORS

Conference Venue

BACN 2023 will be held at the Royal Welsh College of Music and Drama (RWCMD) in Cardiff. Details of the venue (map, travel, parking) are available online https://www.rwcmd.ac.uk/how-to-find-us .

By bus: Buses 21, 23, 25, 27, and 35 stop outside the College. There are National Express (Sophia Gardens, Cardiff CF11 9HW) and Megabus stops (North Road, alongside Friary Gardens) close to the venue.
By train: The nearest train station with step-free access is **Cardiff Central Station** which is a 5-minute taxi ride or a 20-minute walk away. Alternatively, **Cathays** is the nearest station within walking distance.
By car: The address of the venue is North Rd, Cardiff CF10 3ER. There are Pay and Display car parks opposite RWCMD. There are accessible parking spaces outside the main entrance for drivers who hold a valid blue badge.
By air: The nearest airport is **Cardiff Airport** (https://cardiff-airport.com/).

Social event

On 12th September, there will be a social event at Revolution Cardiff (9-11 Castle St, Cardiff CF10 1BS). Tickets are required to attend this event, which are available to book during registration. The cost (£30) covers a buffet dinner and entertainment (a Twmpath band, traditional Welsh barn dancing).

Presentations and Blitz presentations

Individual presentations: These are 15-minute slots including time for questions so aim for max 12-minute talks.
Datablitz presentations: These should be a maximum of 3 slides. Simple animations (appearing/ disappearing figures etc) are permitted but please keep this to a minimum. Please stay within 3 minutes as the timing will be strictly adhered to by the chair of the session. Remember that blitz presentations act as a taster to encourage people to visit your poster, so you do not have to present everything – be selective.

Poster presentation

- Each poster will be presented on one of the two days.
- The poster schedule of this programme lists poster IDs, authors, and titles.
- Poster boards are 1200mm x 900mm landscape (to fit A0 landscape posters).
- Poster boards will be available from the morning and throughout the day.
- Presenters are expected to present their posters during their assigned sessions.
- At the end of each day, presenters should take off their posters. Any posters left behind will be recycled.

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DAY 1, 12th September 2023

SYMPOSIUM 1: Affect-driven Learning and Information Seeking

Chair**:** Kathrin C J Eschmann (Cardiff University)

Affective states shape how individuals seek information, form memories, and consequently remember information across development. Understanding the individual differences and physiological underpinnings of affective processes is essential for enhancing healthy information seeking and decision making in real life. This symposium brings together researchers investigating how past decisions, social contexts, rewards, and curiosity influence learning and information seeking. Dr Madan will show how past decisions and emotional experiences can affect what we remember. Dr FitzGibbon will focus on post-decision information seeking in children and adults, demonstrating their implications for learning and adaptive decision making. Dr Tomova will present data on the effects of social isolation on reward and threat learning in adolescents. Dr Westermann will discuss whether pupil dilation can be used to measure individual differences in trait curiosity. Dr Eschmann will present data on individual differences in brain circuits and how they enhance curiosity-driven learning and information seeking. Together, this symposium will demonstrate the importance of affective processes in learning and information seeking, suggesting how to optimally harness them in order to improve knowledge acquisition and wellbeing.

Christopher R Madan (University of Nottingham)
Memory and beliefs: How our past experiences shape what we remember
Lily FitzGibbon (University of Stirling)
Counterfactual curiosity: Motivated thinking about what might have been
Livia Tomova (University of Cambridge)
Effects of social isolation on reward and threat learning in human adolescents
Xiaoyun Chen (Lancaster University)
Pupil dilation as a measure of individual differences in curiosity
Kathrin C J Eschmann (Cardiff University)
Curiosity enhances information seeking and memory via the dopaminergic circuit

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INDIVIDUAL PRESENTATIONS 1

Andres Canales-Johnson (1), Martin Vinck (1), Dora Hermes (1), Misako Komatsu (1)
(1) Department of Psychology, University of Cambridge, UK

Broadband signals but not neural oscillations encode prediction error information across the cortex of mice, marmosets and humans

How is surprising information communicated across the cortex? Hierarchical predictive-coding theory (HPC) posits that inference is implemented by the feedforward (FF) routing of unpredicted signals (i.e. prediction errors, PE), and the propagation of sensory predictions down the hierarchy via feedback (FB) projections [1,2]. Although this principle of inference is widely accepted, it is debated whether PE communication is encoded by rhythms (neural oscillations) or by transient, aperiodic neural activity (non-oscillatory activity) [2,3]. Progress towards arbitrating between both views is still limited due to the disparity of results observed in different animal models and sensory modalities, and by the lack of knowledge on how these neural regimes yield to distributed, inter-areal PE communication across the brain [2]. Here, we arbitrate between two competing hypotheses: (A) PE is communicated through an increase in the synchronization of rhythmic oscillations between cortical areas, or (B) PE is communication through the non-linear broadcasting of aperiodic, transient activity between cortical areas. We combined large-scale intracortical recordings (ECoG, Neuropixels) in mice, marmosets, and humans, with connectivity metrics that discriminate modes of inter-areal communication (linear and non-linear), and information theory metrics separating synergistic from redundant interactions across the cortex. Our results show that PE information is primarily communicated by non-oscillatory rather than oscillatory neural dynamics, in both visual and auditory modalities, and across species.

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Martina Vanova (1,3), Ulrich Ettinger (2), Veena Kumari (3)
(1) Dementia Research Centre, University College London; (2) Department of Psychology, University of Bonn, Germany; (3) Department of Psychology, Brunel University, UK

Positive schizotypy and motor impulsivity modulate responses in ventral attention network during inhibitory control

Inhibitory control aberrations are present in people with various psychopathologies, including schizophrenia spectrum disorders and a history of violence. Deficits in inhibitory control in schizophrenia have also been associated with deficits in attention and aggravated by positive symptoms, especially, delusions. Similarly, people with elevated psychopathy traits showed deficits in inhibitory control associated with attention problems leading to an inability to properly process information.
We investigated behavioural and neural associations between inhibitory control and psychopathology-related traits of schizotypy (Oxford-Liverpool Inventory of Feelings and Experiences – O-LIFE), psychopathy (Triarchic Psychopathy Measure – TriPM), and impulsivity (Barratt Impulsiveness Scale – BIS-11), using a novel Go/No-Go Task featuring human avatars and whole-brain Functional Magnetic Resonance Imaging (fMRI) in healthy adults.
Behaviourally, O-LIFE Impulsive Nonconformity, representing antisocial-schizotypal impulsivity, significantly predicted unsuccessful inhibition (16% of false alarms variance). O-LIFE Unusual Experiences, associated with positive symptoms in schizophrenia, and BIS-11 Motor impulsivity predicted the overall accuracy (15% of d prime – sensitivity index variance).
In fMRI, higher Motor impulsivity uniquely and together with Unusual Experiences was negatively associated with lower activity in the left lingual gyrus during successful inhibition (correct No-Go over
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rest). Additionally, higher Impulsive Nonconformity was associated with lower activity in the caudate nucleus and left anterior cingulate during inhibition in contrast to Go stimuli reactions.
Higher positive schizotypy and Motor impulsivity traits modulate the responses to complex visual stimuli during inhibitory control in the ventral attention network. This led to lower activity in the frontal gyri and anterior cingulate which are responsible for correct inhibition and self-regulation.

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Saurabh Sonkusare (1,2,3), Ding Qiong (2), Yijie Zhao (3), Wei Liu (2), Ruoqi Yang (2), Alekhya Mandali (1), Luis Manssuer (1), Chencheng Zhang (2), Chunyan Cao (2), Bomin Sun (2), Shikun Zhan (2), Valerie Voon (1,2,3)
(1) Department of Psychiatry, Cambridge, UK; (2) Shanghai Jiao Tong University and Ruijin Hospital, China; (3) Fudan University, China

Intracranial EEG reveals beta frequency activity of amygdala relates to valence encoding and its activity is under top-down influence of medial prefrontal cortex

The crucial emotional circuitry of amygdala, orbitofrontal cortex (OFC) and medial prefrontal cortex (mPFC) (1,2) has not been investigated with direct human intracranial recordings. Such high fidelity signals provide an excellent means to uncover fine temporally resolved dynamics. To this end, we acquired intracranial electroencephalography (iEEG) data from a cohort of 35 patients with intractable epilepsy, who underwent an emotional static picture-viewing task (positive, neutral and negative valence conditions) localising 71 contacts in the amygdala, 31 in OFC and 43 in mPFC. We first quantified broad frequency activity (2-140 Hz) responses. Finally, we undertook dyadic connectivity analyses, with a hierarchical approach using functional undirected connectivity (coherence), functional direct connectivity (spectral granger causality) and model based-effective connectivity (dynamic causal modelling - DCM). Task induced activity showed broad frequency profile activity and condition differences in all the three regions. Remarkably, beta activity of amygdala predicted valence ratings. Undirected and directed connectivity with coherence and granger causality analyses respectively, showed predominant coupling in low frequency (<12 Hz) range. Ultimately and critically, effective connectivity analyses with DCM revealed unidirectional connectivity from mPFC to the amygdala and bidirectional communication between OFC-amygdala and OFC-mPFC. Overall, our findings demonstrate a complex orchestration of emotion induced spectral responses, in the amygdala, OFC and mPFC differentiating valence conditions with amygdalar beta activity linking subjective valence ratings. Our biophysical model based analyses provide direct neurophysiological evidence for a much-posited model of top-down influence of mPFC over amygdala and a bidirectional influence between OFC and the amygdala thus extending the current account of prefrontal-amygdala interaction.
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DATABLITZ PRESENTATIONS 1

The effect of theta audio-visual entrainment on episodic memory performance and oscillatory brain activity
Lucy Jackson (1), Amber Jones (2), Dr Lisa Evans (1).
(1) School of Psychology, Cardiff University, UK; (2) School of Biosciences, Cardiff University, UK

An investigation of camera-based visual feedback learning aid for recovery of smell and taste
Veena Kumari (1), Satyam Chauhan (1), Krupa Vakani (1), Elena Antonova (1), and Jacklyn Bryant (2)
(1) Psychology Division, Department of Life Sciences, Brunel University, UK; (2) Centre for Cognitive and Clinical Neuroscience, Brunel University, UK

Role of social interactions in modulating response inhibition
Ioana Mihai (1), Kami Koldewyn (1), Paloma Marì-Beffa (1)
(1) School of Human and Behavioral Sciences, Bangor University, UK

The interplay between internally- and externally-guided decision-making: evidence from three online behavioural experiments
Isabella Colic (1), Nikolay Petrov (1), Jiaxiang Zhang (1,2)
(1) Cardiff University, UK; (2) Swansea University, UK

The role of motion in the neural representation of social interactions in the posterior temporal cortex
Katie Daughters (1), Julia Landsiedel (2), Paul E. Downing (2), Kami Koldewyn (2)
(1) Department of Psychology, University of Essex, UK; (2) School of Human and Behavioural Sciences, Bangor University, UK

Fastball - a new functional biomarker of cognitive impairment
George Stothart (1), Sophie Alderman (1), Liz Coulthard (2)
(1) Department of Psychology, University of Bath, UK; (2) School of Medical Sciences, University of Bristol, UK

Does conduction velocity influence reaction time beyond propagation delay?
Phil Schmid (1), Aline Bompas (1), Derek Jones (1)
(1) School of Psychology, Cardiff University, UK

The relationship between visual acuity and working memory
Paul Bretherton (1), John Barbur (1), Emsal Llapashtica (1), **Corinna Haenschel** (1)
(1) School of Health and Psychological Sciences, City, University of London, UK

Multi-modal predictions of objective RT variability and subjective attentional state ratings
Marlou Nadine Perquin (1,2,3), Marcus Daghlian (4), Gavin Perry (1), Krish Singh (1), Aline Bompas (1)
(1) School of Psychology, Cardiff University, UK; (2) Biopsychology & Cognitive Neuroscience, Bielefeld University, Germany; (3) Cognitive Neuroscience, Faculty of Biology, Bielefeld University, Germany; (4) Spinoza Centre, Netherlands

The effects of curiosity on latent learning and cognitive map formation
Ellen M. O'Donoghue (1) and Matthias J. Gruber (1)
(1) School of Psychology, Cardiff University, UK

INDIVIDUAL PRESENTATIONS 2

Mahek Kirpalani (1), Davide Nardo (1), Vasileios Zikopoulos (2), Michael Anderson (1)
(1) MRC Cognition and Brain Science Unit, University of Cambridge, UK; (2) Boston University

The role of the nucleus reuniens in mediating inhibitory control over the hippocampus

Humans and other organisms have mechanisms enabling them to control the memory retrieval process. Such control becomes especially important when one is confronted with intrusive memories. The precise fronto-hippocampal inhibitory control pathway(s) through which memory suppression is accomplished in humans remains unknown. Compelling evidence in rodents and primates suggests the possibility that a small but critical structure in the ventral midline area of the thalamus known as the nucleus reuniens (NRe) plays a key role in mediating this top-down control process. There have, however been no attempts in human cognitive neuroscience to examine the function of this small but vital nucleus. In the current study, we conducted a meta-analysis of fMRI studies using the Think-No-think (TNT) task. The TNT task has revealed fronto-hippocampal control mechanisms that support retrieval stopping and we sought to understand whether the NRe contributes to this hippocampal modulation. Our results show that the NRe is engaged during retrieval stopping, consistent with a role in top-down control. Ongoing work is examining how the human prefrontal cortex achieves control over hippocampal activity by driving interactions between the nucleus reuniens and the hippocampus and how the inhibitory neurotransmitter GABA might modulate this process.

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Benjamin J. Griffiths (1), Daniel Weinert (2), Ole Jensen (1), Tobias Staudigl (2)
(1) Centre for Human Brain Health, University of Birmingham, UK; (2) Department of Psychology, Ludwig-Maximilians-Universität München, Germany

Gamma-band sensory stimulation enhances episodic memory retrieval

While transient increases in gamma-band activity have long been associated with successful memory retrieval, a causal relationship has yet to be established. Here, we address this by delivering high-frequency visual sensory stimulation during an associative memory task. We found that 32.5Hz and 65Hz visual sensory stimulation applied during recall led to an improvement in memory performance relative to baseline and control stimulation conditions. To understand the mechanistic underpinnings of this effect, we built a pyramidal-interneuronal network gamma (PING) model and drove the network with a variety of exogenous rhythms that emulated the sensory stimulation protocol. These analyses revealed that the aforementioned behavioural results were best explained by 32.5Hz and 65Hz sensory stimulation entraining a slower (i.e., 32.5Hz) gamma oscillation. Altogether, this suggests that gamma-band sensory stimulation can enhance recall by harmonically entraining an endogenous slow gamma oscillation.

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Renzo Lanfranco (1), Marie Chancel (2), August Hägerdal (1), Xiaole Luan (1), Sucharit Katyal (3), Henrik Ehrsson (1)
(1) Department of Neuroscience, Karolinska Institutet, Sweden; (2) Psychology and Neurocognition Lab, Grenoble-Alpes University, France; (3) Max Planck UCL Centre for Computational Psychiatry and Ageing Research, University College London, UK

Body ownership signals enjoy continuous access to conscious awareness

The sense of owning one's body arises from the integration of multiple sensory signals (1,2,3,4). Do the signals that carry body ownership information enjoy stable access to awareness? To induce and manipulate body ownership, researchers typically use the rubber hand illusion (RHI), which involves stroking a person's hidden hand alongside a visible fake rubber hand placed in front of them (1,3); this induces the feeling that the rubber hand is their own. Here, we use a body ownership discrimination paradigm that objectively quantifies body ownership processing in a bias-free manner by simultaneously inducing the RHI with two rubber hands (5,6,7). Graded stimulation asynchronies between them are introduced using robot arms, and participants must report which rubber hand feels most like their own. We present four experiments that have been analysed under type-1 and 2 signal detection theoretic (SDT; 8,9) analyses to test how different visuotactile manipulations modulate perceptual and metacognitive body ownership sensitivity; one of these experiments also involved electroencephalography (EEG) to determine the neural signatures of perceptual and metacognitive body ownership sensitivity by using event-related (ERP), multivariate decoding (MVPA), and functional connectivity analyses. Our results suggest that body ownership information enjoys continuous access to conscious awareness, supporting the notion that body ownership is a crucial component of self-awareness.

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Özge Gezer (1), Christoph Teufel (1), Stephanie Van Goozen (1,2), Elisabeth Von Dem Hargen (1)
(1) Cardiff University Brain Research Imaging Centre, School of Psychology, Cardiff University, UK; (2) Department of Clinical Child and Adolescent Studies, Leiden, University, Leiden, The Netherlands

Influence of context on facial emotion recognition in an at-risk sample of children with emotional difficulties

Many neurodevelopmental psychopathologies are characterised by emotion recognition difficulties which are typically evaluated with isolated facial expressions. However, it is well-established that context substantially influences facial emotion recognition in the typical population. For instance, when faces are shown in the context of a body, emotion recognition from faces in both adults and children is biased towards the emotion of the body posture. Critically, the magnitude of this bias is determined by individual differences in the precision of facial emotion recognition, with more precise recognition leading to less influence of body posture. In the current study, we assessed whether similar principles for the integration of facial and bodily emotion cues apply to children, who are at-risk of developing psychiatric conditions. 124 children (aged 4 to 8) from the Cardiff University Neurodevelopment Assessment Unit (NDAU) were included in the study. These children did not meet the criteria for a psychiatric diagnosis at the time of testing, but they represent a unique at-risk sample with emotional, cognitive and/or behavioural difficulties. Children's abilities to discriminate isolated facial expressions, isolated body postures and facial expressions in the context of an expressive body were assessed as part of a larger battery of cognitive and emotional tasks. Children showed a strong influence of body posture when making judgments about facial expressions. Importantly, however, individual differences in isolated facial expression emotion recognition performance drove the extent of bias towards body posture. This finding suggests that despite impaired isolated facial expression and isolated body posture emotion recognition, the integration of face and body signals of emotion in children, who are at-risk of developing psychiatric conditions, follows the same principles as typically developing children.
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PRIZE TALKS

2022 Early-Career Prize Lecture by Jennifer Cook (University of Birmingham)

Social and non-social learning: Common, or specialised, mechanisms?

The last decade has seen a burgeoning interest in studying the neural and computational mechanisms that underpin social learning (learning from others). Many findings support the view that learning from other people is underpinned by the same, 'domain-general', mechanisms underpinning learning from non-social stimuli. Despite this, the idea that humans possess social-specific learning mechanisms - adaptive specializations moulded by natural selection to cope with the pressures of group living - persists. In this talk I explore the persistence of this idea. First, I present dissociations between social and non-social learning - patterns of data which are difficult to explain under the domain-general thesis and which therefore support the idea that we have evolved special mechanisms for social learning. Subsequently, I argue that most studies that have dissociated social and non-social learning have employed paradigms in which social information comprises a secondary, additional, source of information that can be used to supplement learning from non-social stimuli. Thus, in most extant paradigms, social and non-social learning differ both in terms of social nature (social or non-social) and status (primary or secondary). I conclude that status is an important driver of apparent differences between social and non-social learning. When we account for differences in status, we see that social and non-social learning share common (dopamine-mediated) mechanisms.

2023 Early-Career Prize Lecture by Freek van Ede (Vrije Universiteit Amsterdam, Netherlands)

Anticipating behaviour through working memory

Working memory is about the past but for the future. Adopting such a future-focused perspective shifts the narrative of working memory as a limited-capacity storage system to working memory as an anticipatory buffer that helps us prepare for potential and sequential upcoming behaviour. In my talk, I will present a series of our recent studies that have started to reveal emerging principles of a working memory that looks forward – highlighting, amongst others, how selective attention plays a vital role in prioritising internal contents for behaviour, and the bi-directional links between visual working memory and action. These studies show how studying the dynamics of working memory, selective attention, and action together paves way for an integrated understanding of how mind serves behaviour.

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DAY 2, 13th September 2023

SYMPOSIUM 2
Constructing Reality: Neurocognitive Mechanisms of Non-veridical Perception

Chairs: Jamie Ward (University of Sussex) and Christoph Teufel (Cardiff University)

Non-veridical perceptions are a class of phenomena in which perceptual experiences occur in the absence of external stimulation. They range from essentially normative experiences (e.g., mental imagery) to those experienced by a minority of people (e.g., hallucinations, synaesthesia). They are taken as prima facie evidence for the constructive nature of perception more generally, as exemplified in this quote from Anil Seth: "We're all hallucinating all the time; when we agree about our hallucinations, we call it reality." But why does this consensual reality sometimes break down across individuals? And why are some non-veridical perceptual experiences accepted by the observer as 'real' (i.e., externally elicited) and others are not? This symposium will seek to address these and related questions providing a state-of-the-art summary of evidence from psychophysics, neuroimaging, and computational models of perceptual decision-making in both clinical and non-clinical groups.

Anil Seth (University of Sussex)
What is real? Adventures in the (mis)perception of reality
Nadine Dijkstra (University College London)
Fundamental constraints on distinguishing imagination and reality
Magda del Rio (University of Sussex / University College London)
Different mechanisms of non-veridical perception as revealed from a conditioned hallucinations paradigm
Christoph Teufel (Cardiff University)
Contents of internally generated percepts are determined by an interaction between sensory noise, short-term expectation, and conscious awareness
Paul Fletcher (University of Cambridge)
Unshared realities: lessons to be learned from perceptions in neurological and psychiatric illness

INDIVIDUAL PRESENTATIONS 3

Alexis Deighton MacIntyre (1), Tobias Goehring (1)
(1) MRC Cognition and Brain Sciences Unit, University of Cambridge, UK

Speech perception under acoustically degraded listening conditions: The Role of Language Familiarity

During speech listening, recurring patterns of neural activity become temporally coupled to stimulus features, such as the speech envelope (1). This cortical tracking can be measured using electroencephalography (EEG). Quantifying speech-brain coupling (e.g., as a correlation coefficient) sheds light on the neural processes underlying perception and may hold promise in clinical applications (i.e., as an objective measure of speech encoding fidelity); however, cortical tracking is an aggregate measure that likely represents brain activity at different stages of auditory and linguistic processing. Hence, disentangling the relative contributions of auditory versus linguistic, motor, and other cognitive "top-down" computations remains a challenge (2). In this EEG study (n = 36), we obtain cortical tracking measures across acoustically unprocessed and spectrally degraded speech. To dissociate sensory processing from linguistic-motor predictions, the speech is in an either familiar (English) or unfamiliar, but closely related, language (Dutch); moreover, all naturalistic stimuli are produced by a single bilingual speaker, thereby ensuring maximal experimental control. Unlike previous studies examining speech intelligibility (3), here, we devised a novel prosodic target detection task performed regardless of language familiarity. This addresses the important confound of waning attention when speech is not understood. We observe that linguistic intelligibility modulates cortical tracking and that the magnitude of its effect is larger and more consistent than that observed for acoustic condition: spectral degradation does not appear to impact cortical tracking of the speech envelope, despite its clear effects on subjective reports and objective detection task performance. We discuss our findings with a view both to the rapidly growing literature on cortical tracking, as well as the greater difficulty of differentiating sensory from internally guided speech processing.

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Jonathan Silas (1), Wayne Anderson (1), Kielan Yarrow (2), **Alexander Jones** (1)
(1) Middlesex University, UK; (2) City University London, UK

Spatial attention is not affected by alpha or beta transcranial Alternating Current Stimulation: a registered report

Using Electroencephalography (EEG) an event-related change in alpha activity has been observed over primary sensory cortices during the allocation of spatial attention. This is most prominent during top-down, or endogenous, attention, and nearly absent in bottom-up, or exogenous orienting. These changes are highly lateralised, such that an increase in alpha power is seen ipsilateral to the attended region of space and a decrease is seen contralaterally. Whether these changes in alpha oscillatory activity are causally related to attentional resources, or to perceptual processes, or are simply epiphenomenal, is unknown. If alpha oscillations are indicative of a causal mechanism whereby attention is allocated to a region of space, it remains an open question as to whether this is driven by ipsilateral increases or contralateral decreases in alpha power. This preregistered report set out to test these questions. To do so, we used transcranial Alternating Current Stimulation (tACS) to modulate alpha activity in the somatosensory cortex whilst measuring performance on established tactile attention paradigms. All participants completed an endogenous and exogenous tactile attention task in three stimulation conditions; alpha, sham and beta. Sham and beta stimulation operated as controls so that any observed effects could be attributed to alpha stimulation specifically. We replicated previous behavioural findings in all stimulation conditions showing a facilitation of cued trials in the endogenous task, and inhibition of return in the exogenous task. However, these were not
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affected by stimulation manipulations. Using Bayes-factor analysis we show strong support for the null hypotheses – that the manipulation of Alpha by tACS does not cause changes in tactile spatial attention. This well-powered study, conducted over three separate days, is an important contribution to the current debate regarding the efficiency of brain stimulation.

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Michail Ntikas (1), Eleonora Parrotta (1), Giorgio Ganis (2), Elsa Fouragnan (2), Patric Bach (1)
(1) School of Psychology, University of Aberdeen, UK; (2) School of Psychology, University of Plymouth, Plymouth, UK

How perceptual anticipations affect movement perception: the neural correlates of action perception in a social context

Recent proposals argue that our understanding of other people's behaviour emerges from a predictive process that "paints" expectations about others' future behaviour onto ones' own perceptual system, in a process of Bayesian-like hypothesis testing revision. We will report data from two experiments (original study and follow-up replication) implementing an experimental paradigm in which people's perception of others' behaviour is guided by perceptual anticipations of their forthcoming actions. Participants saw hands reaching and withdrawing from objects, after hearing the actors state their intention to either "take" or "leave" this object. When people reported the perceived disappearance points of the hands, these judgments were biased towards the induced expectations. By performing single trial EEG analysis, we identified pre-stimulus alpha activity over the occipital lobe as the selective carrier of the perceptual anticipations. We find that, on a trial-by-trial level, alpha activity over the occipital lobe is positively related to the effect perceptual anticipations have on action perception. We were also able to identify that two post-stimulus ERP components linked with stimulus processing (central P2 & P3b) mediate the size of the perceptual judgment biases. Again, on a trial-by-trial level, we find that the size of those components is negatively related to the effect perceptual anticipations have on action perception. P2 and P3b therefore reflect the updating of one's prior expectation by the sensory input, which, when unresolved, leads to increased perceptual biases towards expectations. These findings argue for a framework in which prior expectations – and their revision through stimulus processing – shape social perception.
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DATABLITZ PRESENTATIONS 2

Measuring trust in virtual characters with the Wayfinding Task: Validating immersive and desktop virtual reality and comparing remote and in-person testing
Michael F Clements (1), Larissa Brübach (2), Jessica Glazov (1), Stephanie Gu (1), Rahila Kashif (1), Caroline Catmur (1), Alexandra L Georgescu (1)
(1) Department of Psychology, King's College London, UK; (2) Human-Computer Interaction Group, Julius-Maximilians University of Würzburg, Germany

Cognitive and motor speed relate to distinct demographic and cognitive characteristics in older adults using SEM
Sabina Baltruschat (1), **Indra Bundil** (1), Jiaxiang Zhang (1,2)
(1) CUBRIC, School of Psychology, Cardiff University, UK; (2) Department of Computer Science, Swansea University, UK

The positive dimension of schizotypy is associated with self-report measures of autobiographical memory and future thinking but not experimenter-scored indices
Lucie Reed (1), Lisa Evans (1)
(1) CUBRIC, School of Psychology, Cardiff University, UK

Brain activation changes during psychomotor vigilance task in problematic internet use: task-based fMRI study
Ákos Arató (1), Hussamalddin Ali Alhour (1), Anna Tímea Szente (1), Eszter Áfra (1), Gábor Perlaki (1,2), Gergely Orsi (2), Gréta Kis-Jakab (2), András Matúz (3), Szilvia Anett Nagy (2), Árpád Csathó (3), Gergely Darnai (1,3), József Janszky (1)
(1) Department of Neurology, University of Pécs, Hungary; (2) Pécs Diagnostic Centre, Pécs, Hungary; (3) Department of Behavioural Sciences, University of Pécs, Pécs, Hungary

Do the same cognitive systems support perception and memory? A healthy special populations perspective
Emily Whelan (1), Rebecca Ovalle (2), Nicolas Rothen (2), Jamie Ward (1)
(1) University of Sussex, UK; (2) FernUni Schweiz – FUSC

Paying attention, the cost of stress during aging
Guyan Sloane (1), Nick Cooper (1)
(1) Department of Psychology, University of Essex, UK

Defining the four factors of visual hypersensitivity using a novel measure: the Cardiff Hypersensitivity Scale
Alice Price (1), Rebecca Oates (1), Petroc Sumner (1), Georgina Powell (1)
(1) School of Psychology, Cardiff University

Global structural constraints emerge spontaneously in a predictive coding network and interact with context-specific expectations to determine representational efficiency
Stefan Brugger (1, 2), Rosalyn Moran (2), and Christoph Teufel (1)
(1) School of Psychology, Cardiff University, UK; (2) Centre for Academic Mental Health, University of Bristol, UK; (3) King's Institute for Artificial Intelligence, King College London, UK

In your skin? Somatosensory cortex is purposely recruited to situate but not simulate observed touch
Bettina Forster (1), Sonia Abad Hernando (1)
(1) City, University of London, UK

The effect of surprise on processing events
Dominika Varga (1), Petar Raykov(1), Elizabeth Jefferies(2), Aya Ben-Yakov(3), Chris Bird(1)

(1) School of Psychology, University of Sussex, UK; (2) Department of Psychology, University of York, UK; (3) The Edmond & Lily Safra Center for Brain Sciences, Hebrew University of Jerusalem

SYMPOSIUM 3: From Cognitive Neuroscience to Empirical Aesthetics and Back Again

Chair: Prof Beatriz Calvo-Merino (City, University of London)

This symposium evaluates the synergy between empirical aesthetics and neurally-inspired theories within cognitive/social neuroscience. We will present an analysis of this interaction and describe new work that overcomes laboratory limitations and allows exploring the social individual in the real world. The importance of embodiment theories and sensorimotor processing in aesthetic perception will be explored by **Vasiliki Meletaki** in a series of studies understanding the extent of the dancer's expertise in emotion and aesthetic perception (using EEG) and by **Stacey Humphries**, who will revise what we can learn about the neural mechanism of aesthetic experience from Parkinson Disease. **Edward Vessel** will explore individual differences and discuss how large-scale networks, classical theories (Default Mode Network, fMRI) and new developments in machine learning, are integrated to understand art perception and natural events. Moving away from the laboratory, **Rebecca Chamberlain** and **Letizia Palumbo** will expand on their EEG embodied aesthetics work by using psychophysiological and behavioural measures in the real gallery setting. Finally, **Guido Orgs** will bring novel approaches by measuring audience engagement from large groups of spectators simultaneously using hyper-scanning and EEG during live dance performances. These advances contribute to the establishment of Neuroaesthetic as a newly recognized discipline within Cognitive Neuroscience.

Edward Vessel (Max Plank Institute for Empirical Aesthetics)
Neural correlates of visual aesthetic appeal
Vasiliki Meletaki (University of Pennsylvania)
A generalized effect of expertise on visual and sensory regions in aesthetic and emotion perception
Stacey *A.* Humphries (Goldsmith, University of London)
What can we learn about the neural mechanism of aesthetic experience from Parkinson's Disease
Rebecca Chamberlain *(*Goldsmith, University of London)
Sensorimotor processing in aesthetic evaluation of drawings in the laboratory and the gallery
Letizia Palumbo *(*Liverpool Hope University)
The role of visual exploration and personal traits on aesthetic responses to art in the real gallery setting
Guido Orgs *(*Goldsmith, University of London)
Experiencing art in social settings: measures of real-time audience neural engagement using hyper-scanning

2023 Mid-Career Prize Lecture by Jie Sui (University of Aberdeen)

Self as Processes

An understanding of the self helps explain not only human thoughts, feelings, attitudes but also many aspects of everyday behaviour. This talk focuses on a viewpoint - self as processes. This viewpoint emphasizes the dynamics of the self that best connects with the development of the self over time and its realist orientation. We are combining psychological experiments and data mining to comprehend the stability and adaptability of the self across various populations. In this talk, I draw on evidence from experimental psychology, cognitive neuroscience, and machine learning approaches to demonstrate why and how self-association affects cognition and how it is modulated by various social experiences and situational factors.

BACN
British Association for Cognitive Neuroscience

LIST OF Day 1 POSTERS (including Poster + Datablitz)

ID	Author	Title
1	Lucy Jackson	The effect of theta audio-visual entrainment on episodic memory performance and oscillatory brain activity
2	Veena Kumari	An investigation of camera-based visual feedback learning aid for recovery of smell and taste
3	Ioana Mihai	Role of social interactions in modulating response inhibition
4	Isabella Colic	The interplay between internally- and externally-guided decision-making: evidence from three online behavioral experiments
5	Katie Daughters	The role of motion in the neural representation of social interactions in the posterior temporal cortex
6	George Stothart	Fastball - a new functional biomarker of cognitive impairment
7	Phil Schmid	Does conduction velocity influence reaction time beyond propagation delay?
8	Corinna Haenschel	The relationship between visual acuity and working memory
9	Marlou Nadine Perquin	Multi-modal predictions of objective RT variability and subjective attentional state ratings
10	Ellen O'Donoghue	The effects of curiosity on latent learning and cognitive map formation
11	Elia Valentini	Investigation of alpha brain oscillations as neural marker of prolonged experimental pain
12	Harpreet Singh	Self-referential processing in Depression
13	Biao Zeng	Visual benefit effect in synchronous and asynchronous audio-visual speech perception: evidence from N1 and behaviour
14	Roksana Markiewicz	When I budge but you don’t: Inter player theta power coupling forecasts future joint action outcome
15	Flavia De Luca	Prefrontal and parietal contribution to event perception during story listening.
16	Elisa Carrus	Does melodic expectation influence emotional processing of words?

17	Natasha Burns	The impact of distraction during response inhibition in young and older adults
18	Tasbiha Khan	In your skin: Touch observation effects on motor control
19	Khetam Al-Faraj	A systematic review and meta-analysis of EEG signal in chronic pain patients during ongoing and provoked pain
20	Kasia Mojescik	Age differences in the mechanisms underlying remembering events vividly and confidently
21	Samuel David Jones	A maturational frequency discrimination deficit may explain developmental language disorder
22	Xiaoyun Chen	Neural correlates of visual uncertainty and curiosity
23	Nick Simonsen	Investigating effects of reward anticipation on memory for unrelated stimuli
24	Sinan SUZEN	A novel genotypic assay for COMT gene Val158Met variation in studying human cognitive differences
25	Michella Feldborg	My future is crystal-clear: vivid future self-Concepts in social cognitive processing
26	Stephanie Yoke Ping Chua	A cross-cultural investigation into the unitisation mechanism of perceptual learning
27	Nicholas Souter	Measuring and reducing the carbon footprint of fMRI preprocessing in fMRIPrep
28	Mathy vandhana Sannasi	Do Artificial Intelligence (AI) algorithms and humans see an emotion in faces in the same way?
29	Emily Kerry Cunningham	Around the clock: Physiological markers of lapses in attention during sustained task performance.
30	Chelsea Owen	The effect of age on speech breathing characteristics
31	Naomi Lee	The neural time-course of the self-positivity bias: Other-negativity is processed before self-positivity
32	Yang Li	Time flows vertically in Chinese
33	James Read-Tannock	Cortical morphology networks: integrating multiple structural MRI metrics using a multi-layer network approach
34	Bradley Halliday	Implicit body perception at the Pelvic Girdle with the two-point estimation task: a reliability study

LIST OF Day 2 POSTERS (including Poster + Datablitz)

ID	Author	Title
1	Michael Clements	Measuring trust in virtual characters with the Wayfinding Task: Validating immersive and desktop virtual reality and comparing remote and in-person testing
2	Indra Bundil	Cognitive and motor speed relate to distinct demographic and cognitive characteristics in older adults using SEM
3	Lucie Reed	The positive dimension of schizotypy is associated with self-report measures of autobiographical memory and future thinking but not experimenter-scored indices
4	Ákos Arató	Brain activation changes during psychomotor vigilance task in problematic internet use: task-based fMRI study
5	Emily Whelan	Do the same cognitive systems support perception and memory? A healthy special populations perspective
6	Guyan Sloane	Paying attention, the cost of stress during aging
7	Alice Price	Defining the four factors of visual hypersensitivity using a novel measure: the Cardiff Hypersensitivity Scale
8	Stefan Brugger	Global structural constraints emerge spontaneously in a predictive coding network and interact with context-specific expectations to determine representational efficiency
9	Bettina Forster	In your skin? Somatosensory cortex is purposely recruited to situate but not simulate observed touch.
10	Dominika Varga	The effect of surprise on processing events
11	Alexander Jones	Dissociating temporal position and rhythm – effects on memory encoding.
12	Isabella Colic	A systematic review of M-EEG evidence on value-based decisions in humans: experimental paradigms and spatiotemporal characteristics
13	Felicia Chiu	Evaluating spatial working memory in a well-established mouse model of vascular cognitive impairment
14	Elliot Freeman	Neurochemical basis of the visually-evoked auditory response: evidence from smoking/vaping behaviour
15	Manda Fischer	Identifying core brain regions involved in memory-guided attention: A systematic review and meta-analysis
16	Yusuf Quasem	Assessing spatial working memory deficits in a mouse model of hypoperfusion
17	Chloe Brunskill	Counterfactual imagination as a source of memory distortion: cognitive and brain mechanisms
18	Vasilis Ioakeimidis	Randomised controlled feasibility trial of HD-DRUM, a novel drumming training app for cognitive and motor symptoms in people with Huntington's disease
19	Sophie Alderman	A passive, neural correlate of verbal fluency in Mild Cognitive Impairment using Fastball neurocognitive assessment.
20	Thomas James	Developing EEG and MEG biomarkers: Promising measures of age-related change in active and resting brain states

21	Francesca Nannetti	Investigating the role of neuronal oscillations in the top-down control of visuospatial attention
22	Satwika Rahapsari	Associations between early-life stress and cognitive control: A systematic review and meta-analysis of prospective longitudinal studies
23	Nourah Alruwais	Serum measures of neuro-biomarkers in healthy mid-age APOEe4 carriers
24	W. Joe MacInnes	The spatial Leaky Competing Accumulator model for shifts of attention
25	Abigail Finn	Individuals with ASD show an increased influence of body posture on facial expression perception
26	Riccardo Sacripante	Forgetting of gist memory in the healthy and clinical population
27	Tara Ghafari	Modulation of alpha oscillations by attention is predicted by hemispheric asymmetries of subcortical regions
28	Kiran S Garcha	The predictive power of sensory processing
29	Olga Leticevscaia	How does the brain mitigate the distracting information is working memory: concurrent TMS-fMRI study
30	Orsolya Székely	Somatic and sensory symptoms in chronic pain conditions: A network analysis
31	Yumi Hamamoto	Decrease of neural activation in the temporoparietal junction was related to a decrease in the discrepancy between self and ideal body sizes
32	Xinyue Zhang	Schema and memory selection: Schemas and memory selection: the impact of test cue congruency on selective retrieval
33	Nick Davis	Impaired retrospective episodic memory, but preserved prospective memory and rate of recall in heavy alcohol users
34	Zhuoen Lu	Dynamic fronto-occipital alpha-band neural couplings in self-saliency processing