The fifth meeting of

Consciousness Research Network (CoRN 2025)

King Chulalongkorn Memorial Hospital

Bangkok, Thailand

5-8 August 2025

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Program Overview

The fifth meeting of the Consciousness Research Network aims to foster interdisciplinary dialogues and collaborations among leading experts, emerging researchers, and students at the intersection of neuroscience and philosophy.

Themes of our talk sessions:

- Mental imagery & Hallucination
- Modeling, Agency, Representation, & Creativity
- Perspectives, Bodies, & the Boundaries of Consciousness
- Sensation & Conscious Access
- Perception & Cognition
- Feedback Loop & the Predictive Mind
- Who & What is Conscious?

Our poster sessions are divided into two days and are assigned according to the talk themes of the day.

Detailed Program

All keynote lectures and talk sessions will take place in Room 302.

August 6th

8:15 - 8:45 am: Registration
8:45 - 9:00 am: Welcome Address - Room 302
9:00 -10:00 am: Keynote Speaker: Joel Pearson (University of New South Wales)
Conjuring Consciousness: Mental Imagery, Aphantasia, and Unconscious Imagery
Moderator: Tzu-Yu Hsu

10:00 - 10:15 am: Coffee & Snacks Break - Room 309

10:15 - 11:55 am: Talk Session #1: Mental imagery & Hallucination
Moderator: Yaron Caspi
Speakers:
Lu Teng (Australian National University)
Conscious Schematic Imagery in Aphantasia
Keisuke Suzuki (Hokkaido University)
Hallucination Machines – Toward computational neurophenomenology
Qiantong Wu (CASIP)
An Enactivist Interpretation of Aphantasia
John Pallas (Archive Therapy, LLC.)
The Presence Exchange Hypothesis of Felt Presence Experiences

11:55 am - 1:25 pm: Lunch Break and Poster Session #1 - Main Foyer

1:30 - 3:05 pm: Talk Session #2: Modeling, Agency, Representation, & Creativity
Moderator: Tony Cheng

Speakers:

Wen Wen (Rikkyo University)

Sense of agency as a phenomenon and an ability

Stuart WG Derbyshire (National University of Singapore)

Revisiting Libet: Exploring the Experience of Freedom with a Simulated BCI

Lawrence Ray Espino (Ateneo de Davao University/University of the Philippines Diliman

How Would You Formalize a Representational Theory of Consciousness?

Joachim Nicolodi (University of Cambridge)

Consciousness in the Creative Process and the Problem for AI

3:05 - 3:20 pm: Coffee and Snacks Break - Room 309

3:20 - 5:00 pm: Talk Session #3: Perspectives, Bodies, & the Boundaries of Consciousness

Moderator: Tzu-yu Hsu

Speakers:

Celia R. Blaise (University of Sheffield)

Where do I stop? How Observer Perspectives Distort Our Body Boundaries

Nevia Dolcini & Chu Kinlok (University of Macau)

Perspectival Consciousness

Caleb Liang (National Taiwan University)

Double Body Effect and the Proprioceptive-Vestibular Self in Virtual Reality

I-Jan Wang (University of Cincinnati)

Skepticisms and Agnosticisms of Selfless Memory

7:00 - 9:00 pm: Reception Dinner: Boat Cruise on Chao Phraya River

August 7th

9:00 -10:00 am: Keynote Speaker: Jonathan Schooler (UCSB)
Metaphors of the mind: photomosaics, three-dimension of time and the kite of consciousness
Moderator: Chaipat Chunharas

10:00 - 10:15 am: Coffee and Snacks Break - Room 309

10:15 am - 12:20 pm: Talk Session #4: Sensation & Conscious Access
Moderator: Po-Jang (Brown) Hsieh
Speakers:
Christopher L. Asplund (Yale-NUS College, Singapore)
Somatosensory Surprise and the Experience of Vibration, Heat, and Pain
Hsin-I (Iris) Liao (NTT, Inc)
Pupil light response evoked by invisible brightness is free from attention modulation
Chai-Youn Kim (Korea University)
Multisensory interactions outside conscious awareness
Lok-Chi Chan (National Taiwan University)
A New Materialist Account of Subjective Ineffability
Eve A. Isham (University of Arizona)
Temporal errors: Insights from spatial comparisons and metacognitive evaluation

12:20 - 1:50 pm: Lunch Break and Poster Session #2 - Main Foyer

1:50 - 2:30 pm: Talk by Global Committee: Tzu-Yu Hsu (Taipei Medical University)
The Neural Architecture of Shifting Between Internal Thoughts and External Perceptions
Moderator: Kanit Sirichan

2:30 - 4:35 pm: Talk Session #5: Perception & Cognition
Moderator: Shao-Min (Sean) Hung
Speakers:
David Alais (The University of Sydney)
A new 'tracking' version of Continuous Flash Suppression to quantify suppression strength: constant CFS suppression

for all image types & two times the suppression strength of binocular rivalry

Tim Brady (UCSD)

Continuous variation in perceptual awareness

Aleksandra Mroczko-Wasowicz (University of Warsaw)

Do perceivers contribute to object perception? Exploring grades of subject-dependency

Sang Chul Chong (Yonsei University)

Intuitions About Consciousness Support Flexible Deployment of Attention in Visual Search

Hyungrae Noh (Pusan National University)

Interpreting Psychophysical Laws: A Case for Illusionism for Consciousness

5:00 - 10:00 pm Art Exhibition and Networking

August 8th

9:00 - 10:00 am: Keynote Speaker: Sascha Fink (FAU Erlangen-Nürnberg)
When is your red my red? Phenomenal Distance and Structural Approaches to Consciousness
Moderator: Ying-Tung Lin

10:00 - 10:15 am: Coffee and Snacks Break - Room 309

10:15 - 11:30 am: Talk Session #6: Feedback Loop & the Predictive Mind
Moderator: Niall Duncan
Speakers:
Kanit M. Sirichan (Chulalongkorn University)
Consciousness and Shared Action Ontology
Shigeru Tagushi (Hokkaido University)
Recursive Connectability of Loops: Toward a Monoid Model of Consciousness
Alexander Cilliers (University of Western Australia)
Predictive processing, 'pure consciousness', and Troxler's Fading

11:30 am - 1:00 pm Lunch and Career Networking - Room 301

1:00 - 1:45 pm Business Meeting - Room 302

1:45 - 2:30 pm Book Symposium: Joel Pearson (University of New South Wales)

2:30 - 2:45 pm: Coffee and Snacks Break - Room 309

2:45 - 4:00 pm: Talk Session #7: Who & What is Conscious?
Moderator: Niall Duncan
Speakers:
Hakwan Lau (Institute for Basic Science)
Abuse of Animal Consciousness
Pawel Zięba (Jagiellonian University in Cracow)
A Naïve Realist Theory of Consciousness
Christoph D. Dahl (Taipei Medical University)
Individual recognition memory in a spider

4:00 - 4:15 pm: Goodbye Address - Room 302

International Keynote Lectures

Conjuring consciousness: Mental Imagery, Aphantasia, and unconscious imagery

Joel Pearson, University of New South Wales
National Health and Medical Research Council fellow
Director of Future Minds Lab, University of New South Wales, Sydney Australia

Mental imagery offers a unique window into consciousness. While neuroscience has long focused on removing consciousness (masking, binocular rivalry, and flash suppression), now, with a range of measurement techniques (binocular rivalry, pupillometry, skin conductance), we're finally investigating the more compelling question of how consciousness creates itself. The influence of mental imagery extends beyond mere subjective experience, demonstrating measurable effects on perception, cognition, and behaviour. Research has established that imagery can modulate perceptual awareness, facilitate priming, induce sensory adaptation effects, and even alter subsequent perceptual processing. These empirical findings suggest that imagery and perception share substantial neural mechanisms. As with unconscious perception, emerging research points to the existence of unconscious mental imagery. Aphantasia—the absence of visual imagery— suggests that 5% of the population lack the ability to voluntarily generate conscious experiences, underscoring the diversity of our conscious inner worlds. This new frontier of our consciousness research is shedding light on the role of feedback signals, individual differences, resting activity and brain area size in consciousness

Metaphors of the mind: photomosaics, three-dimensions of time and the kite of consciousness

Jonathan Schooler, University of California, Santa Barbara
Director, Center for Mindfulness and Human Potential,
Acting Director, SAGE Center for the Study of the Mind

This talk integrates and extends the metaphors of the mind used in two recent theories of consciousness. Riddle and Schooler's (2024) Nested Observer Window (NOW) model proposes that consciousness can be conceived as a nested hierarchy of windows (loci of information integration) that can be likened to a photomosaic where each pixel is itself an image. Our first person perspective corresponds to the apex observer window which represents our gestalt experience of the lower level nested observer windows, each of which maintains its own gestalt representation (and possibly consciousness) and each of which itself integrates lower level windows, and so on. Schooler & Riddle's (2024) three dimension of time model proposes that these windows move through time in a manner that can be likened to moving through the three dimensions of space with objective time (clock time) corresponding to the x axis, subjective time (the passage of time as it is experienced) corresponding to the z axis, and alternative time (branching alternative timelines) corresponding to the y axis. In this talk, we offer a further metaphor for conceptualizing how these windows of consciousness relate to time. As an alternative to conceptualizing the windows as moving through time, we imagine time moving through the windows, much like the wind flows through the sails of a kite. From this vantage, consciousness can be conceived of as the sail of a kite, which is itself composed of smaller sails. Each sail, although tethered to the others, has the capacity for movement in the three dimensions of time. Although all sails are inexorably moving through objective time (x axis) at the same rate (which can be conceptualized as the speed of the wind), each individual sail can move with some independence in the subjective time dimensions enabling it to shift its pitch along the z axis and thereby impacting the experienced passage of time. Sails also have the potential to shift their yaw in the y axis, enabling them to realize alternative next moments. Collectively, the kites are tethered together hierarchically which provides constraints on the degrees of potential movement for each individual kite. In addition to providing an alternative perspective for conceptualizing the NOW and Three Dimensions of Time theories, this model suggests a way of imagining how time moves through consciousness and potentially how our perspective could impact the manner in which time unfolds. It also offers a visual for conceptualizing how all conscious beings might be collectively tethered together.

When is your red my red? Phenomenal Distance and Structural Approaches to Consciousness

Sascha Fink, Friedrich-Alexander-Universität Erlangen-Nürnberg
Director of Centre for Philosophy and AI Research

"Might two individuals, under identical external circumstances, have different experiences without noticing it? Locke's "inverted spectrum" (IS) thereby asks how we can inter-personally individuate experience. Structuralists answer that it is the degrees of difference and similarity between possible experiences that individuates the character of each type of experience one can have. So instead of an intrinsic property (a quale) giving an experience its character, it is the whole net of relations between experiences (the phenomenal space) that determines unique character. Then, inverted spectra are impossible due to the asymmetries of quality spaces: Asymmetric shapes cannot be fully mapped into each other (Hilbert & Kalderon, 2000; Lyre 2022). The differences would be noticeable. Recently, Kawakita et al. (KZJTO 2023; 2024) suggested a method to empirically approximate when two individuals experience the same colour based on this approach.

However, this presupposes that we have a handle on distance in phenomenal spaces. If we cannot measure a dissimilarity distance between an experience A and B, then we cannot establish that a phenomenal space itself is asymmetric. Unfortunately, phenomenal distance is often judged paradoxically: going 4 just-noticeable steps from colour A to colour B and from A to colour C might still lead to the experience that the distance AB is larger than AC (Kuehni 2003). Similar issues arise for odour, temperature, and so on (see e.g. Herz 2011).

Here, I investigate several potential solutions. Most fail to ensure the impossibility of inverted spectra. In the end, I argue that synaesthesia and associations must play a crucial role in a structuralist's answer to Locke's inverted spectrum."

Special Talk by Global Committee

The Neural Architecture of Shifting Between Internal Thoughts and External Perceptions

Tzu-Yu Hsu[1,2]
[1]Institute of Cognitive Neuroscience, National Central University, Taiwan
[2]Graduate Institute of Mind, Brain and Consciousness, Taipei Medical University, Taiwan

While humans effortlessly toggle between internal thoughts and external perception, neuroscience has focused primarily on switching between external rules rather than cognitive domains. We investigated the neural mechanisms underlying this fundamental capacity using EEG (N=46) and fMRI (N=60) during a color judgment task where participants switched trial-by-trial between objective color similarity judgments (external domain) and subjective preference evaluations (internal domain). EEG revealed temporally distinct signatures for domain switching, with enhanced P300-like components and differential topographical patterns for internal-to-external versus external-to-internal transitions during 300-500 ms post-stimulus. Critically, fMRI demonstrated that between-domain switches bypass traditional task-switching networks entirely. Internal-to-external shifts specifically activated primary visual cortex, pre-supplementary motor area, and putamen, while external-to-internal transitions showed no significant activation differences compared to maintaining external focus. These findings provide the first comprehensive temporal and spatial neural characterization of domain switching, revealing that transitions between internal cognition and external perception operate through specialized mechanisms distinct from conventional rule-switching processes. Our results illuminate a fundamental yet understudied aspect of human cognition: how the brain orchestrates the continuous dance between inner experience and outer reality.

Talks by Themes

Session #1: Mental Imagery & Hallucination

Conscious Schematic Imagery in Aphantasia

Lu Teng[1]
[1]Australian National University

Aphantasia is a condition where individuals report being unable to voluntarily generate conscious visual imagery. However, empirical research shows that aphantasics perform competently on various imagery-related tasks, presenting a puzzle: how do these individuals succeed in such tasks? To address this, I propose a novel explanation: aphantasics rely on a form of conscious visual imagery that has been largely overlooked. Specifically, by distinguishing between “painterly” imagery, which involves fine-grained representations of object appearance, and “schematic” imagery, which is more abstract and less detailed, I argue that aphantasics engage in conscious schematic imagery—allowing them to perform these tasks effectively.

Hallucination Machines – Toward computational neurophenomenology

Keisuke Suzuki[1]
[1]Hokkaido University

Our perceptual experiences do not directly mirror physical reality, as vividly demonstrated by illusions, dreams, and especially hallucinations—perceptions occurring without external stimuli. These phenomena suggest perception arises from the brain's top-down predictions about sensory inputs, aligning with theories such as the Free Energy Principle and predictive processing.

This talk will specifically address visual hallucinations through a novel approach that combines deep neural networks with immersive virtual reality. Our "Hallucination Machine" employs an algorithm that "inverts" a Deep Convolutional Neural Network, originally trained for image classification, to generate visual experiences akin to psychedelic-induced hallucinations within immersive XR environments. Moreover, using generative adversarial learning, our extended model distinguishes psychedelic-like hallucinations from those typical in neurodegenerative diseases such as Lewy Body Dementia and Parkinson's disease. These distinctions have been validated through patient interviews and targeted experiments.Notably, these hallucinations

spontaneously arise from the inherent feature representations learned by neural networks rather than explicit design by an artist/engineer.

I propose the term "computational neurophenomenology" for this approach, wherein computational models aim not at optimising objective perception or cognition tasks, but at replicating subjective phenomenological experiences. Integrating generative AI, XR technologies, and neuroscience, computational neurophenomenology offers valuable insights into atypical perceptual experiences. This interdisciplinary approach promises advancements in understanding the neural bases of hallucinations and contributes philosophically to our comprehension of conscious phenomenology.

An Enactivist Interpretation of Aphantasia

Qiantong Wu[1]
[1]Chinese Academy of Sciences, Institute of Philosophy (CASIP)

This paper proposes an enactivist interpretation of aphantasia. The proposal of the enactivist interpretation will be based on a new conceptualization of mental images from an enactivist perspective. In particular, the enactivist interpretation proposes that aphantasic subjects cannot voluntarily generate mental images because the balance between brain activities and body-environment interactions is disrupted.

The first section explains the enactivist interpretation of mental images: mental images are conceptual content generated with the support of body-environment interactions. In the generation of mental images, the function of body-environment interaction is two-fold: it enables the subject to be properly situated in the physical environment; it also signifies the phenomenal absence of the generated images from the first-person perspective. This two-fold function makes the body-environment interaction a significant part of the generation of mental images, even though the content of mental images is irrelevant to particular objects in the environment.

The second section develops an enactivist interpretation of aphantasia based on relevant empirical findings. This interpretation suggests that aphantasic subjects fail to generate mental images because of the disrupted balance between brain activities and body-environment interaction, which leads to: 1) the conceptual content of the mental images overwhelms their phenomenal characteristics; and 2) the “phenomenal absence” signified by the real-time body-environment interaction becomes so profound that the mental image fails to be conceptualized as vivid. This enactivist interpretation is argued to be more advantageous than other philosophical interpretations in explaining relevant empirical findings.

The Presence Exchange Hypothesis of Felt Presence Experiences

John Pallas[1]
[1]Archive Therapy, LLC.

The felt presence (FP) experience – the experience of a conscious observer in the absence of a physical cause – is not well understood in cognitive science. A recent review by Barnby et al. (2023) surveys cognitive and neurobiological approaches to explaining the experience, but few theoretically novel studies have been conducted since Cheyne (2001), Nielsen (2007), and Solomonova (2008). The current paper proposes a novel explanation of FP called the Presence Exchange Hypothesis.

Expanding on Cheyne's threat-detection theory, Nielsen's social imagery model, and Solomonova's predictive coding concept, this hypothesis generalizes the FP mechanism as a universal social function. It suggests that FP is a cognitive strategy involved in the normal or everyday modelling of other minds. In the "exchange," an individual suppresses the inherent perception of their own self-presence and instead allocates the feeling as having originated in another person, generating the sense of a presence of an external agent. This mechanism establishes a boundary between self and other, laying the groundwork for attributions of intentionality, empathy, associative learning, and social synchronization.

In extreme circumstances, FP may be useful for threat detection. When dysregulated, it may lead to symptoms of pathology such as paranoia, auditory hallucinations, delusions or fragmented identity. Cross-culturally, it may underlie the experience of spiritual beings, or those of religious devotion. However, these explanations are not grounded in normal or everyday functioning. The Presence Exchange Hypothesis seeks to explain FP as a basic social adaptation that modulates the existing experience of self-presence to improve interpersonal prediction, cooperation, and social functioning.

Session #2: Modeling, Agency, Representation, & Creativity

Sense of agency as a phenomenon and an ability

Wen Wen[1]
[1]Rikkyo University

The sense of agency refers to the subjective feeling of controlling one's own actions and, through them, external events. But is this feeling merely a by-product of voluntary action, or does it serve important functions for humans? I argue that it is essential to distinguish between these aspects when discussing the sense of agency. As a phenomenon, it is considered to be closely linked to consciousness. In this talk, I will explore how this experience emerges from sensory input. As a capacity, the sense of agency plays a crucial role in differentiating the self from others and enhances our understanding of the interaction between the external world and the self. I will also discuss individual differences in the sensitivity and criterion of the sense of agency, and how these differences relate to other cognitive functions.

Revisiting Libet: Exploring the Experience of Freedom with a Simulated BCI

*Stuart WG Derbyshire[1], Avelle Wong Shi Ying[1], Yun Da Chua[2], Jason Wong Yik Horng[2], En-Lin Leong[2], Andrei Dragomir[2], Christopher L. Asplund[1,2,3]
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[3]Department of Biomedical Engineering, National University of Singapore, Singapore

The readiness potential (RP), a slow EEG buildup prior to voluntary action, has played a central role in debates about free will. Libet (1979) famously showed that the RP consistently appears over 200ms before participants report any conscious intention to move, concluding that unconscious brain activity initiates action before the conscious will arises. This interpretation, and the experimental design underpinning it, has been widely critiqued for reducing freedom to a punctate moment, embedding volition into a linear cause-effect chain, and relying on introspective timing in a highly artificial task.

Drawing on a lesser-known study by Grey Walter (Dennett, 1991), we conducted a behavioural analogue of a closed-loop brain-computer interface (BCI) experiment. Twenty participants were asked to press a button to change an observed slide (from slide 1 to 2) "whenever you feel like

it." On some trials, the slide changed just before the button press—mimicking what a predictive system might do. Five participants reported a sense that the computer "knew" they were about to act.

We are developing a BCI to use real-time neural activity to predict and pre-empt, within 100ms, a larger repertoire of actions in response to more complex decision-making tasks. While this will not escape the unreasonable spatial and temporal constraints of Libet's setup, it may offer a more direct way to explore how free will is experienced—or "expressed"—within such constrained experimental contexts. These are not the general conditions of freedom, which typically involve greater possibilities for action and more personally meaningful intentions, but they may still reveal something about how it feels to exercise freedom in the sharply punctuated moments characteristic of Libet's approach.

How Would You Formalize a Representational Theory of Consciousness?

Lawrence Ray Espino[1]
[1]Ateneo de Davao University / University of the Philippines Diliman

One way of accounting for consciousness argues that our subjective experiences can be accounted for in purely functional terms. The phenomenal character of an experience (i.e., its what-is-it-like-ness) can be reduced to its representational content. A key task in developing a functionalist account of consciousness is answering the question: Given some subjective experience and assuming that functionalism is correct, how can functionalism account for the experience in the form of a mental representation? One must examine the literature on cognitive architecture in order to develop an answer.

Historically, there have been two dominant paradigms in modelling cognition. The symbolic paradigm provides a formal description of representations in the form of symbols. On the other hand, the subsymbolic or connectionist paradigm formalizes representations in the form of patterns of activation over a network of units. Each individual unit receives weighted input from neighboring units and calculates its activation value. This paper presents a defense for the connectionist approach in modelling cognition against the Fodor and Pylyshyn's Systematicity Challenge – the accusation that connectionist systems cannot explain the systematicity and compositionality of thoughts. It first provides a brief background on symbolic and subsymbolic approaches. After reviewing the Systematicity Challenge, it then discusses how Paul Smolensky's use of role decomposition allows connectionist systems to produce representations that respect both compositionality and systematicity. Building on Smolensky's approach, the paper then shows how subjective experiences might be accounted for in a connectionist system that utilizes tensor product representations.

Consciousness in the Creative Process and the Problem for AI

Joachim Nicolodi[1]
[1]University of Cambridge

When examining the neural mechanisms behind human creativity, we find remarkable parallels to the workings of modern LLMs. Yet a key worry remains: human creativity depends, at least in part, on consciousness, something current AI models appear to lack. More specifically, humans rely on consciousness when evaluating their creative output. This suggests two strategies: either deny that evaluation is necessary for creativity, or argue that AI can be conscious in the relevant sense. The first option is implausible, since it would force us to label even the familiar "monkey at a typewriter" scenario as creative. In a neglected part of her work, Margaret Boden (2004) adopts the second approach. She claims that only access consciousness, not phenomenal consciousness, is needed for creativity. In her view, creativity is guided by background rules that determine an idea's worth. Evaluating creative output simply involves retrieving the idea, applying these rules, and judging the outcome – no phenomenal experience required. Since AI can perform such operations, it can, in principle, be creative. However, while Boden's argument works well for mathematics and science, it may not universally apply to the arts. In some artistic cases – particularly those that break with tradition and established rules – artists seem to rely exclusively on their phenomenal experiences to judge the value of an insight. Still, art can also be rule-based, leaving room for Boden's account. Thus, even if her view is somewhat coarse, it remains convincing: P-consciousness is not necessary for creativity, and therefore not an obstacle for creative AI.

Session #3: Perspectives, Bodies, & the Boundaries of Consciousness

Where do I stop? How Observer Perspectives Distort Our Body Boundaries

*Celia R Blaise[1], Holly C Clark[1], Hannes P Saal[1,2]
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[2]Insigneo Institute for in silico Medicine, University of Sheffield, Sheffield, UK

The ability to distinguish one's own body from the external world is fundamental to our sense of self and interactions with our environment. While prior research suggests that this boundary's clarity can fluctuate, precise assessments of anatomical body boundary perception remain underexplored. Across two studies, we investigated how accurately individuals perceive their body boundaries without visual input, alongside self-reported measures of mental imagery, embodiment, and the perspective adopted in dreams and memories.

Our findings revealed that participants demonstrated millimeter-level precision when identifying their body boundaries, although accuracy differed by body region and individual differences captured in the self-report measures. For example, participants who frequently experienced dreams from a third-person perspective performed significantly worse overall, whereas those who reported more out-of-body experiences showed greater accuracy in judging only their ankle boundaries but not their hand boundaries—a pattern not observed in other participants.

Overall, our findings suggest that the dominant perspective adopted in one's mind significantly influences the perception of bodily boundaries, affecting both its overall precision and the specific regions where accuracy shifts. We discuss possible explanations for these effects, emphasizing the importance of an egocentric viewpoint in forming our understanding of our bodies.

Perspectival Consciousness

*Nevia Dolcini[1,2], Gary Kin Lok Chu[1]
[1]Department of Philosophy and Religious Studies, Faculty of Arts and Humanities, University of Macau, Macao, China
[2]Centre for Cognitive and Brain Sciences, University of Macau, Macao, China

Self-consciousness is typically viewed as consciousness of oneself as oneself, implying that for self-consciousness, more is required than mere consciousness of such and such. Opponents of this view, also known as the "Independence Thesis", regard consciousness as dependant upon self-consciousness ("Dependence Thesis"), based on insights into the 'phenomenology of the

self' and the ubiquitous, pre-reflective, non-conceptual, peripheral, perspectival yet inherently first-personal form of self-awareness accompanying all experiences (Frankfurt 1988; Hurley 1997, 1998; Bermúdez 1998; Gallagher & Zahavi 2020). In support of the Independence Thesis, we argue against the first-personal character of such primitive perspectival consciousness. We begin by distinguishing between broad and narrow readings of 'perspectival consciousness', where the former, but not the latter, consider perspectival consciousness as containing an insoluble first-personal core. We then show that the broad reading of perspectival consciousness fails to match the linguistic data from self-referring statements involving indexicals, as well as descriptions and proper names. Rather than being a first-personal source of experience, we maintain, perspectival consciousness is the a-personal origin – but not the source – of experience. This geometrical perspective-specific (view-)point contributes a common locus of agency that aligns well with embodied approaches to consciousness. Furthermore, we integrate our linguistic analysis with data from clinical reports on the Cotard syndrome, where patients exhibit the symptom of 'speaking of oneself in the third person' (Leuret 1834), thereby providing further support for the narrow reading of perspectival consciousness and, consequently, the Independence Thesis.

Double Body Effect and the Proprioceptive-Vestibular Self in Virtual Reality

*Caleb Liang[1,2], Wen-Hsiang Lin[3], Wei-Kai Liou[8], Bo-Yu Chen[4],
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Is it possible for us to experience ownership of two bodies (double body ownership) located at different places (double body locations)? Call this experiential combination the Double Body Effect. It involves various types of bodily self-consciousness (BSC), including body ownership, self-location, body-location and 1PP-location. Most previous studies of BSC used visual-tactile manipulations to induce bodily illusions. This approach is fruitful but fails to capture a key feature of BSC, that is, we can feel our own body "from the inside". To remedy this deficiency,

we developed a new approach by focusing on the proprioceptive sense and the sense of balance from within the body. Immersed in a virtual gym, the participants stepped onto a Bosu ball while watching a life-sized avatar stepping onto a virtual Bosu ball. This immediately caused the participants to wobble their body involuntarily in order to maintain balance. Then they saw the avatar splitting into two identical avatars. In the 1PP condition, the participants' visual 1PP was set in the middle between the two avatars. In the 3PP condition, it was set in the middle but about 60 cm behind the two avatars. The constant bodily wobbling triggered the participants' proprioceptive sense and their sense of balance. The results showed that, in both conditions, the participants felt that both avatars were their own and that their body was simultaneously located in the locations of the two avatars. Together, we demonstrated that it is indeed possible for healthy subjects to experience the Double Body Effect. Our findings suggest a critical stance on some influential views of BSC. We also argue that the Double Body Effect can serve as a preliminary model for understanding the perplexing phenomenology of heautoscopy.

Skepticisms and Agnosticisms of Selfless Memory

I-Jan Wang[1],
[1]Department of Philosophy, University of Cincinnati

Research on allegedly selfless conscious states, such as those experienced during meditation or psychedelic experiences, often relies on subjects' retrospective reports after they regain self-consciousness. However, philosophers question the validity of memory as a tool for measuring past selfless states. A central concern is the issue of performative self-contradiction: while the remembered content asserts a lack of self-consciousness, the act of remembering inherently involves self-referencing, introducing self-involving content to the remembered content. This contradiction fosters skepticism about selfless memory, suggesting that undistorted recollection of past selfless states may be impossible.

In "Selfless Memories" (2024), Raphaël Millière and Albert Newen challenge this skepticism by proposing a remembering scenario in which the performative self-contradiction can be dismissed. In this presentation, I respond to their argument in two ways. First, I argue that skepticism about selfless memory takes multiple forms, and Millière and Newen address only one. Consequently, the broader concern about the validity of selfless memory remains. Second, I introduce a distinct challenge: agnosticism about selfless memory, which asserts that we cannot reliably know whether our recollections of past selfless states are accurate. Unlike skepticism, which doubts the possibility of selfless memory, agnosticism questions its reliability. To clarify and assess these challenges, I develop a conceptual framework of memory content variation that categorizes different forms of skepticism and agnosticism. Using this framework, I argue that Millière and Newen's defense of selfless memory is insufficient, as it addresses only one of eight

concerns, leaving the others unresolved.

Session #4: Sensation & Conscious Access

Pupil light response evoked by invisible brightness is free from attention modulation

*Hsin-I (Iris) Liao[1], Yung-Hao Yang[2]
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The Pupil Light Response (PLR, pupil response to luminance intensity) is not merely a primitive reflex. Accumulating evidence indicates that PLR is modulated by spatial attention and reflects the subject's perception of brightness, as influenced by phenomena such as illusory brightness, mental imagery, and scene interpretation of brightness. The current study examined whether PLR is modulated by visual awareness and how it interacts with feature-based and spatial attention. We used continuous flash suppression to render dark and bright Gabor patches invisible under different attentional demands. In Experiment 1 (feature-based attention), human participants were instructed to pay attention to either the luminance (dark or bright) of a Gabor patch or its orientation (clockwise or counterclockwise). In Experiment 2 (spatial attention), one black and one white Gabor patch were presented side by side, and attention was directed to one location using a rapid serial visual presentation (RSVP) task. We adopted both subjective visibility and objective judgment criteria to exclude ineligible trials and participants who showed potential awareness of the suppressed stimuli. The results showed reliable, but attenuated, PLR to invisible stimuli compared to visible control stimuli. Similar amounts of PLR were found in both the attending to luminance and attending to orientation conditions. In contrast, when attending to a particular location, PLR was found only when the stimuli were visible. The overall results suggest that PLR is modulated by visual awareness. While PLR for visible stimuli is modulated by attentional and perceptual factors, PLR to invisible brightness remains intact yet resistant to attention modulation. This highlights a dissociation between the mechanisms underlying awareness-dependent and attention-modulated components of the PLR.

Somatosensory Surprise and the Experience of Vibration, Heat, and Pain

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A relatively novel or unexpected event (a "surprise") can capture attention to the detriment of ongoing tasks. These surprise capture effects can be profound, with an otherwise obvious stimulus failing to be seen or heard. The effects are also transient, evaporating after a few trials containing the surprise stimulus. In this talk, I will consider what extending surprise investigations to the somatosensory modality can reveal about learning and conscious experience.

In a series of experiments, we showed that relatively rare (low-probability) vibrotactile stimuli can cause a failure to feel, impairing the discrimination of vibrotactile targets presented 300–600 ms later. Targets were often missed even when all vibrations were delivered to the same skin location and surprise stimuli were presented at different intensities. Surprise effects habituated across repeated presentations, demonstrating rapid learning. As such, the consequences and trajectory of surprise capture appear to be similar for vibrotactile sensation, vision, and audition.

Intriguingly, a follow-up experiment with thermal stimuli revealed a key difference. Participants rated their subjective surprise for both frequent and rare stimuli. Some rare stimuli were sufficiently warm to be perceived as painful. Frequent stimuli were rated as low in surprise, while the initially high ratings for rare non-painful stimuli declined across presentations. Rare painful stimuli, however, showed a different pattern: Their surprise ratings started and remained high throughout. This lack of habituation may reflect unique features of pain’s experience and behavioral relevance. Since painful stimuli remain surprising, they continue to redirect attention long after learning reduces the effects of non-painful stimuli in different sensory modalities.

Multisensory interactions outside conscious awareness

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Visual experiences are enriched by concurrent information of another sensory modality, implying multisensory interactions. Whether such interactions occur even outside conscious visual awareness has been of interest, but studies so far have provided mixed results. In this talk, I will introduce two recent studies of my laboratory addressing this issue. The first study examined whether invisible motion through continuous flash suppression (CFS) interacted with audible motion during motion adaptation. The effect of audiovisual motion direction congruency was measured by the duration of the resulting motion aftereffect (MAE). The second study used CFS to render perceptually invisible a ball-shaped object constantly moving and bouncing inside a square frame window. To examine whether audiovisual temporal correspondence facilitates the

ball stimulus to enter awareness, the visual motion was accompanied by click sounds temporally congruent or incongruent with the bounces of the ball. With results from the two studies, I will discuss impacts of task demand, causal inferences, prior experience, and or expectations in multisensory interactions outside conscious awareness.

A New Materialist Account of Subjective Ineffability

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Ineffability is widely regarded as one of the key features of subjective phenomenal experience by both materialists and non-materialists. The idea is that such experience, often conceptualized in terms of qualia, is not expressible in terms of public language, and thus scientific investigation can only target the objective, public aspects of the world and not such subjective aspects. Materialists typically employ accounts under the umbrella term “phenomenal concept strategy” to explain this ineffability; yet, the resulting idea about the relationship between phenomenal and theoretical concepts appears incomplete, as it leads to the implausible consequence that phenomenal information is completely isolated. I propose a new account of phenomenal ineffability that clarifies these issues while offering a deflationary reconstruction. Drawing on the Enlightenment distinction between primary, secondary, and tertiary qualities in a non-literal way, this account explains why certain phenomenal concepts remain untranslatable into theoretical concepts. The central idea is that the distinction hinges on whether the qualities exhibit resemblance to the posits of the dominant scientific paradigm. I argue that if we interpret what people take to be public language in this deflationary manner, then the ineffability of secondary qualities is effectively explained, while primary qualities are regarded as effable and not susceptible to informational isolation. The relevant ideas will be discussed in relation to complex system emergence. The paper ends with some surrounding issues, such as its operational value in evaluating certain claims of ineffability (e.g., that of the altered states of consciousness under psychedelic drugs).

Temporal errors: Insights from spatial comparisons and metacognitive evaluation

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Awareness of temporal errors remains relatively underexplored compared to other perceptual domains. While temporal cognition is often linked to and highly correlated with spatial

cognition, the extent to which we can monitor and correct temporal errors—either in comparison to or within the context of spatial processing—remains an open question.

In this presentation, we examine temporal performance and error monitoring through three studies. Study 1 compares perceptual learning in the temporal and spatial domains as a function of explicit feedback and internally driven metacognitive evaluation. Study 2 provides evidence for the dissociation between temporal and spatial information in a temporal reproduction task, highlighting domain-specific processing mechanisms. Study 3 suggests that self-referential events, such as self-generated actions and egocentric navigation, may amplify fluctuations in temporal errors.Collectively, these findings offer insight into how temporal cognition align with or diverge from spatial information processing, contributing to a broader understanding of domain-specific and shared mechanisms in perceptual learning and metacognitive limitations.

Session #5: Perception & Cognition

A new 'tracking' version of Continuous Flash Suppression to quantify suppression strength: constant CFS suppression for all image types & two times the suppression strength of binocular rivalry.

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A dynamic stimulus presented to one eye can suppress a static target in the other for long periods (continuous flash suppression: CFS). The suppressed target eventually becomes visible and this duration (bCFS) is often used to index unconscious processing. Controversially, faster breakthroughs are considered evidence of visual processing without awareness while opponents claim breakthrough times simply vary with low-level stimulus properties. bCFS times alone cannot solve this: suppression thresholds are needed as a baseline to compare with breakthrough thresholds. Our new 'CFS tracking' paradigm (tCFS) quickly measures contrast thresholds for breakthrough and suppression so suppression strength can be calculated. Participants simply track their changing perceptual states as a suppressed image steadily increases in contrast until visibility (i.e., breakthrough) and then decreases until re-suppression is reported, then increases again (and so on, in a continuing cycle). Using tCFS we confirm: (i) breakthrough thresholds do differ across target types (e.g., grating vs face), as bCFS has shown, but (ii) suppression thresholds show a parallel pattern of differences, thus (iii) suppression strength is the same for all images (~14-15 dB for gratings, noise, objects, food, faces, biological motion). Uniform CFS suppression strength indicates a single mechanism of CFS suppression, likely in primary visual cortex where left and right eyes combine, and prior to processing of objects and image identity. Using the tracking paradigm with binocular rivalry (BR) reveals half as much suppression: ~7-8 dB. In both BR and CFS, suppression is reduced when the stimulus is paired with a congruent multisensory stimulus.

Continuous variation in perceptual awareness

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In the real world, objects are discrete physical entities - your coffee mug either is or is not in your hand. As a result, both in everyday life and in perception and memory research, there is a tendency to use a physical metaphor to understand our mental representations: people tend to

think of an object they are trying to perceive or remember as either in mind or not in their mind, and to say that we hold items in memory, as we hold real objects in our hand. In studies of perceptual awareness, this discrete thinking is often formalized using models that fit psychophysical data, and are based on the premise that people often completely fail to encode or perceive an object and we can measure how often this occurs. In this talk, I'll review our recent work re-examining this view and suggesting a simple alternative model that accounts for large swaths of data on perceptual awareness with only a single continuous gradation in the strength of item's representations, and without any concept of discrete all-or-none failures.

Intuitions About Consciousness Support Flexible Deployment of Attention in Visual Search

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How do we effectively deploy attention to acquire relevant information from our environment? Over a lifetime, individuals develop intuitive beliefs about the relationship between consciousness and cognitive functions. These intuitions enable us to predict which representational contents are necessary and sufficient for performing specific goal functions, thereby supporting the flexible deployment of attentional modes depending on task context. For example, during visual search, individuals may initially adopt a broad attentional scope to scan a scene efficiently and may later narrow their focus to identify a target or widen it again to confirm the target's absence. Furthermore, when searching for the same object across repeated contexts, attentional breadth may gradually become optimized as observers develop intuitions about which representational contents of the object are necessary and sufficient for efficient search. We tested these predictions by measuring saccadic amplitudes during visual search tasks and found evidence consistent with these hypotheses. Our findings suggest that intuitions grounded in conscious experience guide attention in ways that optimize search performance.

Interpreting Psychophysical Laws: A Case for Illusionism for Consciousness

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This paper defends illusionism about consciousness by directly challenging non-reductive physicalist interpretations of psychophysical laws, with a focus on the Weber-Fechner law. Illusionism posits that the qualitative, ineffable features of conscious experience are illusory, and that our non-reductionist intuitions about consciousness can be systematically debunked. The central argument is that the Weber-Fechner law, which models the relationship between stimulus

intensity and perceptual magnitude, applies equally well to human perception and to bacterial chemotaxis—despite bacteria being prima facie non-conscious. This formal, cross-domain similarity demands a consistent interpretation: the law quantifies discriminatory capacities that are independent of phenomenal percepts, rather than tracking irreducibly qualitative, subjective properties as non-reductive physicalists claim.

By analyzing both psychophysical and microbiological applications, the paper demonstrates that the semantics of the Weber-Fechner law are preserved across domains, undermining the idea that phenomenal consciousness plays an explanatory role in psychophysical modeling. Attempts to salvage a non-reductive physicalist interpretation—by positing a necessary link between phenomenal percepts and discriminatory capacities—either entail the implausible attribution of consciousness to bacteria or introduce explanatory inconsistencies. The non-conscious interpretation, by contrast, offers a parsimonious, model-based account that debunks the intuitive, non-reductionist beliefs about consciousness and aligns with recent work on the meta-problem of consciousness.

This debunking strategy reveals that phenomenal consciousness, if it exists at all, is a metaphysical "dangler" with no scientific or explanatory role in psychophysics. The illusionist account thus emerges as the more reasonable and scientifically grounded position, replacing the hard problem of consciousness with the illusion problem and providing a unified framework for interpreting psychophysical laws.

Do perceivers contribute to object perception? Exploring grades of subject-dependency

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This paper contributes to a growing conversation in philosophy and the mind sciences regarding subject-dependency of object perception and how the adaptive perceptual system may shape diverse representations of sensory information. Here, we argue that the subject-dependency of object perception can be taxonomized along three grades. Each grade of subject-dependency refers to a more pervasive influence of perceivers on resulting object representations. The first grade, "weak subject-dependency," concerns attentional changes to perceptual content, e.g., when a perceiver is turning her head, plugging her ears, or her attention is primed for a particular cue. The second grade, "moderate subject-dependency," refers to changes in the contingent features of perceptual objects due to action-orientation, location, and agential concerns. For instance, being to the right or left of an object will cause the object to have a corresponding locative feature. Finally, the third grade, "strong subject-dependency," concerns generating perceptual objects whose existence depends upon their perceivers' sensory contributions. These

perceptual objects result from the unique ways in which individual perceivers process sensory information and bind sensory features. Accordingly, different perceivers with differently adapted or developed perceptual systems may represent the same sensory information in different perceptual experiences. To exemplify this nonstandard, subject-dependent form of object perception, we offer empirical evidence from the future-directed anticipation of perceptual experts, and from the feature binding of synesthetes. The paper closes with an invitation to consider perceptual diversity as a virtue rather than a roadblock to successful research on perceptual consciousness.

Is Rich Phenomenology Fragmented?

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A central debate in philosophy of mind concerns whether conscious experience is richer than what we can cognitively access. The Rich View argues that subjects are phenomenally conscious of the full content of iconic memory, while the Fragment View contends that only feature fragments of visual stimuli are conscious, creating an illusion of perceptual richness. Kouider et al. present experimental data to support the Fragment View, suggesting that subjects misreport rotated letters as their upright counterparts due to their fragmented perception. They claim this interpretation uniquely explains the data and undermines the Rich View.

This paper challenges the exclusivity of the Fragment View's explanation. By introducing the LO-VWFA mechanism, which explains automatic perceptual corrections in letter recognition, it argues that erroneous reporting can occur even if subjects are fully conscious of specific letter shapes. Additionally, the paper critiques the theoretical foundations of the Fragment View, exposing its reliance on the gatekeeper model of attention, which faces empirical challenges. Recent neuroscientific evidence suggests that attention is not always necessary for consciousness, reinforcing the plausibility of the Rich View.

By demonstrating that the same data can be explained within the Rich View framework while maintaining its theoretical advantages, this paper concludes that the Rich View remains the superior account of perceptual consciousness, effectively challenging the Fragment View's claim to uniqueness.

Session #6: Feedback Loop & Predictive Mind

Consciousness and Shared Action Ontology

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According to Metzinger & Gallese (2003), the brain's neural networks represent the world by constructing an ontology that is not only an internal model of reality, but one that also reflects the external relational dynamics between entities (an organism and its environment) through action. This ontology consists of two aspects: functional ontology and action ontology. The former explains how the brain functions by (unconsciously) generating a third-person account of shared external systems, while the latter accounts for how an organism phenomenally experiences and interprets the intentionality behind others' actions. The physical brain or subpersonal ontology then brings in the possibility of interpersonal relations or the shared action ontology which explains our consciously experiencing of other actions as meaningful. Metzinger&Gallese's model of shared action is similar to Pacherie (2015)'s model of joint action in terms of their representationalist assumptions. Both explain the causal role of the physical brain in generating the phenomenal consciousness of a shared ontology among group members, which in turn explains the functional role of consciousness, namely, its evolutionary purpose in facilitating our living together. The difference, in my view, is that while Metzinger&Gallese's model is reductionist, Pacherie's is more on a non-reductionist side where joint actions are explained in terms of conscious intentions. A typical problem with reductionism is its failure to address how phenomenal consciousness is possible within the shared action.

Nonetheless, Pacherie's model has difficulty explaing the causal power of the conscious intentions. Although Pacherie's solution is to utilise Dretske's conception of structuring and triggering cause, it is insufficient to resolve the contradiction inherent in her representationalist assumption.

Recursive Connectability of Loops: Toward a Monoid Model of Consciousness

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We undoubtedly experience the phenomenon referred to as 'consciousness,' yet we cannot grasp it as a substantial perceptual object. It possesses a phenomenological status clearly distinct from that of the objects that appear within consciousness itself. In this talk, I will attempt to capture this mode of being of consciousness by means of a certain loop-based approach, referring in

particular to the structure of a monoid in category theory. I will explore the idea that consciousness arises when various sensorimotor loops—or loops of action and perception emerging between our body and the world—give rise to a broad range of possible interconnections among themselves that instantiate the structure of a monoid. Simple sensorimotor loops and predictive processing alone are not sufficient to generate consciousness, since most of these processes operate unconsciously. I suggest that consciousness emerges when a possible 'place' is established for these loops to reflect back upon themselves—not as a substantial entity, but as a virtual reference point. I will consider this possibility by drawing on the monoid structure of category theory and insights from the enactive approach.

The Relationship Between the Brain and Consciousness: From the Perspective of the Enactive Approach and Predictive Processing

Masatoshi Yoshida[1]
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Predictive processing, ‘pure consciousness’, and Troxler’s Fading

Alexander Cilliers[1]
[1]University of Western Australia

Predictive processing (PP) is an exciting theoretical framework merging cognitive neuroscience, philosophy of mind, and Bayesian statistical modelling, which suggests that our experiential manifold is generated by our brain’s inside-out, or top-down, predictive model of us in the world. PP has shown promise in offering a satisfying account of not only perception, but also action and cognition. Consequently, in an effort to move towards a ‘grand unified theory’ of mind and brain, several PP-informed theories of 'consciousness itself' have been proposed. Part of this trend has been attempts to employ the PP framework to account for a class of phenomenal states known as ‘pure consciousness’ or ‘pure awareness’ states. Particularly well-documented in Asian meditative and contemplative traditions, pure consciousness is generally characterised by the complete cessation of perceptual and cognitive processes, while ‘consciousness itself’ remains.

In this paper I endeavour to do two things. Firstly, I provide an overview of recent developments in PP-informed theories of consciousness, describing the fundamental features of these theories, and detailing the extent to which predictive theories of 'pure consciousness' have contributed to these developments. Secondly, I attempt to further our present understanding of the predictive mechanics of pure consciousness states by employing PP-informed accounts of the visual illusion known as Troxler’s Fading as a heuristic device. I propose that contemplative practices

(many of which begin by prescribing the minimisation of sensory and cognitive inputs) precipitate, as a result of the predictive nature of our brains, a kind of self-reinforcing perceptual dampening akin to Troxler's Fading, which is what leads to pure consciousness states.

Session #7: Who & What is Conscious?

Abuse of Animal Consciousness

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Recently, over 400 academics signed a declaration claiming strong scientific support for the presence of phenomenal consciousness in animals such as birds, and suggesting a realistic possibility of the same in many invertebrates, including insects. I do not wish to dispute whether these animals are in fact conscious (or not), but the supposed scientific support is either lacking or irrelevant. The declaration reflects a striking conceptual conflation between phenomenal consciousness and intelligent behavior. It is particularly puzzling that individuals who have previously argued carefully for this distinction nonetheless endorsed the statement—thereby lending it disproportionate media impact, which has led to further exaggerations. I examine how the desire to advance personal worldviews—ethical or metaphysical—has increasingly influenced the research agenda and funding landscape in this field, often at the expense of scientific rigor and integrity. Unless we raise effective objections, this trend risks tarnishing the credibility of the entire discipline and beyond.

A Naïve Realist Theory of Consciousness

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According to naïve realism (a.k.a. relationalism), the phenomenal character of perception is at least partially constituted by the perceived items. Although naïve realism is motivated by attributing crucial explanatory roles to perceptual consciousness, the champions of this view don’t say much about the nature and functioning of consciousness as such. On the contrary, they tend to think of perception as a primitive relation of conscious acquaintance with mind-independent objects in the environment.

However, the construal of perception as primitive acquaintance hinges on a contentious explanatory apartheid in the study of the mind. It presupposes that naïve realism concerns perception ‘in the ordinary sense’, which is a personal state/manifest kind, whereas the science of perception pertains to something entirely different, namely perception qua sub-personal state/scientific kind (French & Phillips 2023). This is a problem because it precludes any informative answer to the question of how neural processes give rise to the irreducible (yet somehow external world-involving) entity that the primitive acquaintance is supposed to be.

I believe that this controversial approach isn't mandatory for the naïve realist. In this talk, I will argue that naïve realism can and should be complemented with a functionalist theory of consciousness. At bottom, my proposal is a fusion of Pure Relationalism about perception identified by Tom Stoneham (2008) with Quotational Higher-Order Thought theory of consciousness put forward by Sam Coleman (2015). On this view, perceptual phenomenal consciousness is essentially a form of access consciousness: becoming conscious of the perceived items consists in embedding mind-independent sensible qualities in unconscious higher-order thoughts.

Can Consciousness Be "Naturalized"? A Philosophical Critique of Neurophenomenology

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The challenge of naturalizing consciousness remains a central issue in philosophy and cognitive science. Many approaches attempt to integrate first-person experience into a scientific framework, often reducing it to neural or computational processes. However, this paper argues that such attempts presuppose the very phenomenon they aim to explain, failing to close the explanatory gap.

Building on Francisco Varela's neurophenomenology, I offer a philosophical critique of these attempts. Rather than reducing consciousness to an objective domain, neurophenomenology emphasizes the interdependence between subjective experience and empirical findings in cognitive science. This paper explores three key issues:
1. The Problem of Causal Explanation: Can neural correlates truly account for lived experience, or do they merely describe correlations without capturing the essence of consciousness?
2. The Irreducibility of First-Person Experience: Why do qualia and subjective experience resist complete scientific explanation?
3. The Role of Embodiment and World-Involvement: How does consciousness emerge from the dynamic interaction between the embodied subject and the world, and why does this challenge mechanistic models?

I argue that a complete naturalization of consciousness may be conceptually impossible—not due to methodological limitations, but because consciousness is not merely a natural phenomenon in a reductive sense. Rather, it is a dynamic, self-organizing structure that remains entangled with the world, challenging mechanistic explanations. Instead of closing the explanatory gap, neurophenomenology offers a pathway to engage with it, preserving the essential philosophical

questions at its core.

The Category Error of Machine Consciousness

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This paper examines the relationship between consciousness and computation by analyzing fundamental organizational differences between biological and computational systems. While recent advances in Large Language Models have sparked renewed discussions about machine consciousness, I propose that understanding these differences provides crucial insights into the necessary conditions for conscious experience.
The analysis focuses on three key organizational principles: (1) the evolution of state spaces and constraints, (2) recursive self-perception and embodiment, and (3) active self-maintenance against entropy. Drawing on insights from consciousness research and biological theory, I argue that these principles may be necessary for supporting the kind of integrated information processing and phenomenal experience characteristic of consciousness.
This framework offers new perspectives on several ongoing debates in consciousness studies, including the hard problem, the relationship between information integration and phenomenal experience, and the validity of behavioral measures of consciousness. The analysis suggests that current computational architectures may lack certain organizational features that biological systems use to support conscious experience, raising important questions about what architectural changes might be necessary for artificial consciousness.

Individual recognition memory in a spider

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Understanding the cognitive capacities of small-brained animals provides critical insights into the minimal neural requirements for complex behaviours such as individual recognition. In this study, we examined whether the jumping spider Phidippus regius - a species not considered traditionally social - can recognise individual conspecifics across repeated encounters. Using a habituation–dishabituation paradigm, we measured changes in proximity between spider pairs as a behavioural proxy of social interest. In habituation trials, spiders were re-exposed to the same individual after a brief separation, typically resulting in reduced approach behaviour - a hallmark of habituation, where repeated exposure leads to dampened neural and behavioural responses. In

contrast, when a novel individual was introduced in dishabituation trials, spiders showed renewed approach behaviour. This dishabituation response reflects the detection of a mismatch between the current input and any stored representation of familiar individuals. The absence of a prior representation for the novel individual triggers heightened interest, suggesting that spiders had encoded specific identities over repeated encounters. These findings demonstrate that individual recognition can emerge in species with minimal neural architectures, challenging the view that such abilities are exclusive to social or large-brained animals. The ability to differentiate conspecifics over time may reflect a basic form of self-other distinction and contribute to ongoing discussions about the minimal conditions required for consciousness in biologically simple systems.

Posters

Posters are sorted by last names. See poster listing for information.

1. **Influence of Mucuna pruriens on Neural-Androgen Receptor and Doublecortin in Hippocampus and Behavioral Modulation**

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Abstract
Mucuna pruriens (Linn.) (MP) is a tropical legume rich in neuroprotective, aphrodisiac, and antioxidant effects. Its complex phytochemical composition contains bioactive compounds like L-DOPA, flavonoids, and phenolic compounds that may synergistically enhance neurogenesis and cognitive function. This study investigated the effects of MP seed extract (ethanolic) on the neural-androgen receptor (AR) and doublecortin (DCX) expression in hippocampal tissue and associated behavioural modulation.
Young Male Wistar rats (200-300 g) were randomly divided into two groups, group I as control animals (C) and group II as MP-treated animals (C+MP 15 days) at the dosage of 200mg/kg body weight. Behavioural assessment was done using a radial arm water maze and open field test. Histometric analysis was done using CFV staining, and a western blot was used for protein detection.
Results showed that MP treatment influenced body weight, improved performance in working and reference memory tasks and affected anxiety-related behaviour. Histometric data indicated a slight increase in the number of cells in the hippocampus of the CA1, CA3 and DG regions in the MP-treated group. Histological analysis revealed changes in hippocampal neurite density. The western blot analysis demonstrated AR and DCX up-regulated in hippocampal tissue. These observations indicate that bioactive or neuroactive compounds of the MP seed extract are capable of crossing the blood-brain barrier. Which positively influences hippocampal tissue. This opens up exciting possibilities for further research into its potential therapeutic effects.

2. **The Age-Related Influence of Testosterone on Cognitive Performance and Hippocampal Synaptic Plasticity in Wistar Rats**

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2. Department Of Anatomy

Abstract

Age and socio-environmental variables significantly modulate the effects of testosterone, a steroid hormone known to influence secondary sexual characteristics and cognitive domains like spatial memory.

Neurosteroids act as neuromodulators crucial for adult neurogenesis, investigating the complex neurophysiological interplay between testosterone and cognition may yield endogenous testosterone levels, influenced by environmental, physiological, and social factors, are implicated in age-related cognitive decline, impacting the quality of life in elderly populations providing valuable insights into memory-related neurodegenerative disorders in hypogonadal and aging males. This study examines the impact of testosterone on hippocampal synaptic plasticity and its correlation with learning and memory under conditions of T deprivation and supplementation

The study was conducted on male young(4-6 months) and aged Wistar albino rats (18-20 months) which were divided into Control(Con) Orchidectomy (ORX), ORX+T, Con+T groups. These experimental groups were subjected to spatial memory analysis by Radial arm water maze and determined anxiety by open-field test. Histopathological assessments were done to determine spinal branching, dendritic density with Golgi-cox technique. The serum analysis of hormones was performed at the end of the experiment.

The spatial learning and memory analyses showed improved performance in working memory of ORX+T and reduced reference memory error young, impairment and inconsistencies in working memory in both Young and Aged ORX. Results indicated reduced anxiety level and exploratory behaviour in young ORX+T rats. Evidence increased spinal density and dendritic arborization suggesting synaptogenesis/plasticity supported by neurogenesis markers.

3. **Evidence for metabolic changes in the posterior cortex in patients with disorders of consciousness**

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Abstract

The brain requires a large amount of energy to function. The majority of this is produced within brain cells from glucose through the citric acid cycle. Changes in energy synthesis capacity within the brain can be associated with alterations to brain function. In disorders of consciousness (DoC), a general reduction in brain energy availability can be observed. This can be seen, for example, in [18F] fluorodeoxyglucose PET. It is not clear, however, what cellular mechanisms may be involved in these changes. Similarly, questions remain open about whether the changes in energy are the cause of the incapacity for consciousness or if they are the consequence. To look further at these issues, we employed magnetic resonance spectroscopy (MRS) in patients with DoC, along with healthy controls. MRS was used to measure a set of brain metabolites, including GABA, glutamate + glutamine (Glx), N-acetylaspartate (NAA), and choline. MRS voxels were located in the posterior-medial cortex. Comparison between the groups showed a reduction in Glx and NAA in patients with DoC. No differences were seen in GABA or choline. Notably, glutamate is a substrate of the citric acid cycle and NAA is suggested to play a specific role in energy production in neural mitochondria. This may point to MRS being a useful tool for better understanding energetic alterations in DoC.

Keywords: Disorders of consciousness, Brain energy metabolism, Magnetic resonance spectroscopy (MRS)

4. **What does a brain do? Arguments from Thought Experiment and Its Implication**
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Abstract

Contemporary neuroscience often presumes that the brain is the generator of consciousness—that conscious experience arises solely from neural activity. This paper challenges that assumption through a thought experiment involving gradual brain replacement. Imagine a person undergoing surgery in which their brain is incrementally substituted with advanced neurotechnology. Would their consciousness persist, fade, or transform? Simultaneously, a mad scientist collects the removed biological brain matter and reconstructs it piece by piece within a computer. Would this reconstructed system gain consciousness?

This scenario produces four philosophical outcomes: (1) if the prosthetic brain is unconscious while the computer becomes conscious, this supports computationalist models; (2) if both are conscious, functionalism is affirmed—consciousness as emergent from organization alone; (3) if neither is conscious, both biological continuity and functional architecture fail, creating a paradox; and (4) if the prosthetic person remains

conscious while the machine does not, then consciousness cannot be reduced to either structure or function alone.

The final outcome implies that the brain is not the source but the mediator of consciousness. This demands a turn toward alternative frameworks: embodied cognition, dual-aspect monism, or Russellian physicalism. Consciousness may depend on biological specificity, sensorimotor embedding, or intrinsic properties not captured by current reductive paradigms. This thought experiment thus reveals a profound epistemic gap in current models of mind.

5. **Modulation of Heart Evoked Potentials during music induced arousal**

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1. National Brain Research Centre

Abstract

Heart Evoked Potentials (HEPs) reflect brain-heart interactions and serve as potential markers of emotional processing. While previous studies have primarily examined HEP modulation using controlled stimuli, their dynamics during naturalistic emotional experiences remain understudied. This study investigated HEP variations during music listening, incorporating continuous arousal ratings.

Twenty-seven participants listened to 8 minutes of music while continuously reporting their arousal levels via joystick, with simultaneous EEG and ECG recordings. Heart rate variability (HRV) measures, including low-frequency (LF) and high-frequency (HF) power, showed no significant differences between rest and arousal conditions. However, HEP analysis revealed significant modulation during music listening. Cluster-based permutation tests identified increased HEP amplitudes between 221–627 ms post-R-peak at frontal clusters, suggesting enhanced cortical processing of cardiac signals during music-induced arousal.

Furthermore, inter-trial coherence analysis was conducted to examine how neural oscillations synchronize with cardiac signals. At rest, phase consistency was higher in the theta and alpha bands, whereas music listening resulted in reduced theta phase coherence while maintaining alpha and beta phase synchronization. This phase analysis provides insight into how neural responses are temporally locked to the R-peak, revealing distinct oscillatory mechanisms underlying brain-heart interactions across different states. These findings highlight the dynamic nature of HEPs in response to music-induced emotional arousal and offer a nuanced perspective on how bodily signals influence brain activity.

6. **High-Fat Diets Induced Learning and Memory Moderation in Juvenile, Young, and Aged Rats: A Comparative Study**

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Abstract

Research data indicate that consumption of high-fat diets (HFD) during the juvenile and adolescent period negatively impacts hippocampal memory and neural-related processes or diminishes cognition and executive function. The present study aims to delineate the influence of a high-fat diet on regulating spine morphogenesis and synaptogenesis in juvenile, young, and aged rat hippocampus and its effect on learning and memory.

Male Wistar albino rats of juvenile, young and aged were used for this study. Based on their age and dietary habits, the animals were grouped into two categories: 1. Standard diet and 2. High-fat diet (HFD) groups. The rats were split into six groups (N=10). After four weeks of high-fat dieting, the rats were subjected to a behavior test. Animals were subjected to the following investigative parameters: radial arm water maze and blood samples. The harvested hippocampus tissue subjected to CFV stain and cell density were analyzed. The Golgi Cox staining sections were used to analyze the dendritic spine and arborization.

The findings displayed eosinophilic degeneration of pyramidal cells, accompanied by disintegrated axons in HFD rats. The HFD group showed a decrease in the number of cells and dendritic spines, resulting in diminished neuroplasticity. In summary, a high-cholesterol diet significantly impacts hippocampal neuronal morphology and negatively influences learning and memory across juvenile, young, and aged rats.

7. **Differential ERP Responses to Acute Stress: How Mood Moderates Memory Encoding and Retrieval**

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Abstract

Memory is influenced by acute stress and mood states. While stress typically impairs recall (Smeets, 2011; Smith & Thomas, 2018), stress timing and depressive symptoms remains unclear. This study investigates how depressed mood moderates the effects of stress timing on memory recall, using EEG to explore the neural mechanisms. Forty-eight participants aged 18–25 were divided into three groups (control, stress-encoding, and stress-retrieval), each with 16 participants. DASS-21 assessed depressed mood. Acute stress was induced via the Cold Pressor Test (CPT) before either encoding or retrieval. Category-cued recall within the Retrieval Practice (RP) paradigm measured memory recall. EEG recorded event-related potentials (ERPs) throughout the experiment. Stress before encoding may enhance consolidation, improving recall, whereas stress before retrieval may impair memory access. Depressed mood is expected to moderate these

effects, with higher depressive moods reducing encoding benefits and worsening retrieval impairments. P300 and late positive potentials (LPPs) are anticipated to reflect these phase-specific differences. This study highlights how stress timing distinctly affects memory recalling, with depressed mood moderating these effect. Findings contribute to understanding stress-related memory dysfunction and cognitive resilience in mood disturbances.

8. **Emotional Judgments Are Shaped by Question Framing**

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Abstract

Research in the field of affective science often requires participants to report their affective state. In this study, we found that the type of question can influence the perception of videos and the variability of responses between participants. To classify video-induced emotions, we used two conditions: Subjective condition (“What do you feel?”): Participants rated each video based on their own emotional experience. Metacognitive condition (“What should be felt?”): Participants rated each video based on what they believed the majority of people would report. A total of 24 participants were recruited and split between the two conditions. Each participant watched 264 emotional short video clips (.gif) and provided valence and arousal ratings. Our findings suggest that the type of question influences the distribution of videos and the variability of emotional ratings. Videos rated in the metacognitive approach showed a shift toward higher arousal and amplified valence. We also found that the variability was higher in the metacognitive condition. These results highlight the importance of question framing when using self-reported measures of emotion, and provide insight into the role of metacognition in emotional judgment.

9. **Do Consciousness Transitions Follow Energy-Minimization Principles in the Brain?**

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Abstract

In daily life, we experience shifts between different levels of consciousness, and this happens naturally. But what happens when the brain loses this ability? For example, due to brain injury, a person may persist in an unconscious state or, like patients with minimal consciousness, may not progress to higher levels of awareness. Each conscious or

unconscious state corresponds to a distinct pattern of activity across brain regions called brain states. The brain relies on internal mechanisms to dynamically change these activation patterns, enabling transitions between states. If these mechanisms are disrupted, the brain may become trapped in its current state.The brain white matter network both facilitates and constrains the range of possible brain states. A previous work has suggested that, due to structural and energetic constraints, the brain tends to shift between local minimum energy states. These low-energy states are more probable and are shaped by structural connectivity. Thus, brain structure guides which states are most likely to occur. Assuming this is a general tendency of the brain, we hypothesize that transitions between different levels of consciousness involve movement between these low-energy stable states. The key question is: what mechanisms or control regions provide the energy to support these transitions? To investigate, we will build a brain model using structural connectivity from diffusion MRI and test it with fMRI data across four stages of consciousness: wakefulness, mild sedation, deep sedation, and recovery. This will allow us to track brain state trajectories and assess whether the brain consistently favors transitions toward low-energy stable states. Future work will explore the conditions necessary to support or enhance such transitions.

10. **Computational analysis of collective dynamics in zebrafish (Danio rerio) groups reveals hierarchical social structure**

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Abstract

Zebrafish have become a valuable model organism in neuroscience and behavioural ecology, particularly suited to quantitative explorations of collective social behaviour. Social cognition may be indirectly inferred from computational analyses of collective behavioural dynamics. In this study, groups of zebrafish (two to seven individuals) were recorded with high-resolution video tracking in a spatially discretised environment, enabling precise quantification of group interactions. Individual fish positions were analysed using information-theoretic methods, specifically mutual information and maximum entropy modelling, to assess the influence of social context on individual behaviour. Empirical distributions of fish locations were compared to independent models, quantifying the contribution of social interactions to group behaviour. Results indicated that uncertainty about individual positions decreased with increasing group size, highlighting that spatial decisions are influenced substantially by the presence of other group members. Maximum entropy modelling further demonstrated that social interactions extend beyond simple pairwise relationships, revealing significant higher-order interaction patterns. These findings indicate that zebrafish group behaviour is shaped by interactions at multiple levels - from pairs to higher-order groupings - that can be systematically characterised using computational models. This approach further highlights the potential for computational modelling of collective behaviour to serve as

an indirect yet scientifically grounded method to explore foundational cognitive processes such as decision-making and social awareness, offering a glimpse into what may be seen as underlying mechanisms contributing to the continuum of animal consciousness.

11. The effect of biased questions: a comparison between Chinese and English

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Abstract

Linguistic relativity suggests that language influences cognitive processes. We examine whether participants' conformity differs between languages when they are presented with questions that strongly imply an expected answer. Languages vary in their yes/no response systems: —some use an agreement-based system, aligning their choice between yes/no with the grammatical form of the question, while others prioritize confirming facts or rejecting implicit expectations. For example, when asked, "He is not happy, right?" in English, the yes/no response typically reflects agreement with the negative statement, such as "No, he is not happy." In contrast, in Chinese, the response is more often based on agreement with the questioner's implication, resulting in "Yes, he is not happy." As an initial attempt, we propose an experiment manipulating (1) the strength of the questioner's expectation (neutral vs. negative questions) and (2) language group (English vs. Chinese speakers). Participants will view ambiguous emotional stimuli (e.g., a neutral face) and answer yes/no questions. We will measure how often responses align with the implicit expectation. A memory task will further examine whether question format affects recall of the stimuli. We expect a stronger questioner expectation effect in the Chinese group, as the yes/no response system may lead them to attend more closely to the questioner's intent. These findings contribute to understanding how language shapes cognition, and future studies should explore whether these effects hold across languages with different response systems.

12. Active Inference and Levels of Self Representation

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Abstract

The insula is a functionally ubiquitous and enigmatic structure. ("All roads lead to the insula" as Moyadi 2014 eloquently put it) Philosophers have paid it little attention despite the fact that it is involved in almost every self referential function and implicated in many disorders of self representation, embodiment and affect. In neuroscience and psychiatry where its role in interoception and affect has attracted a lot of theorising. As well as

Barret and Simmons EPIC (embodied interoceptive predictive coding) model we can note Craig (2009) and Seth et al. (2012) (sentient self); Molnar-Szakacs and Uddin (2022) (Executive Function Gating); Menon and Uddin (2010) (Salience and adaptive switching); Gu (2013) (emotional experience); Sierra (2008, 2009) (affective self awareness) Gerrans (2024) (emotional transcription).
I propose a way of understanding insula function that preserves the insights of these different accounts and squares philosophical accounts of self awareness with the empirical evidence. In particular It suggests Daniel Dennett's "centre of narrative gravity" account misses the target.

(i) The insula should be seen as a hub of self modelling where ‘modelling’ is conceived of within the Active Inference framework as an inference about hidden causes of sensory information.
(ii) the self model is implemented across distributed circuitry in a parameter setting architecture whose activity is anchored by the insula.
(iii) experience of affectively-inflected bodily self awareness is an emergent product of this activity.
(iv) The quality of self awareness reflects a posterior anterior gradient in insula processing that reflects its participation in progressively higher order and more abstract forms of cognition.

13. Experience, Communication and Consciousness

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Abstract

Consciousness is difficult to comprehend, particularly from a scientific stance. This I will argue is because of our limited linguistic abilities that do not allow us to communicate our experiences or sensations, except in a minimal way, to another. Although I can talk about my present experiences to someone listening this does not create in their minds the same whole experience as mine. Think, for example, of a radio commentary about a sports event or trying to describe a colour. Neither can I fully recreate in my own mind one of my past experiences.
The reasons for this can be found by considering the flow and direction of information from something in the world to the eye and then to the mind; and then, if I choose, to the speech-generating part of my mind.
The optic nerve of the eye has a very large number of neurons (about one million) each of which fires in the low Hz region. This information, after processing, produces our visual experience that in turn may stimulate speech. It has recently been proposed that the bit rate of speech is only 39 bits per second. It is therefore clear that speech can't recreate the original visual experience because of the huge disparity in the information content. This

approach leads to the conclusion that although we can have visual experiences, they are outside the possibility of being recreated by us either in the minds of others or later in our own minds. So we have experiences that we are completely unable to describe. This I will argue has considerable implications for our failure to grasp the mysteries of consciousness and can dissolve the so-called philosophical ‘hard problem’. Mammals other than humans have even less communication abilities and can therefore communicate their experiences with an even greater paucity.

14. Tracing the Evolution of Cognition

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Abstract

This article examines the evolutionary development of cognition, exploring how the mind emerged from the chemical and physical transformations of matter within ecological contexts. It argues that the transition from non-living to living matter is gradual, without distinct boundaries. The study investigates the role of dynamic kinetic stability, non-equilibrium states, and self-organizing chemical systems, focusing on processes like autocatalysis and feedback loops. It then traces the evolution of cognitive complexity, highlighting key milestones such as cellular communication, signal transduction, and neural networks. By linking this perspective to ecological factors, the study illustrates how environmental interactions shaped cognitive evolution, offering new insights into the origins of cognition and the emergence of conscious awareness.

15. Revisiting Libet’s Experiment: The Impact of Proprioceptive Manipulation on Volitional Reports

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Abstract

The concept of free will has long been debated, traditionally as a philosophical issue, but Benjamin Libet’s 1980s experiments bridged this debate with neuroscience, giving rise to the "neuroscience of volition." His work suggested that unconscious neural activity precedes conscious intention, a claim that has since sparked extensive discussion.

This research proposal for fellowship critically examines the ongoing debate over the reliability and interpretation of Libet’s findings, particularly concerning M (movement) and W (will) reports. M reports, which indicate when movement occurs, have been scrutinized for their retrospective construction and the influence of sensory feedback. W reports, which record the subjective onset of intention, face similar concerns regarding their validity, with some studies arguing they are inferred rather than directly

experienced. The debate remains unresolved, with evidence supporting both retrospective and prospective interpretations.

A key aspect of this research is proprioception, the body's ability to sense movement, which may shape both M and W reports. Prior studies suggest proprioceptive feedback affects perceived movement onset, and this paper hypothesizes that altering proprioceptive input may influence how individuals report their movement and intentions.

By addressing gaps in understanding the construction of M and W reports, this study aims to provide new insights into the neuroscience of volition, leveraging innovative experimental methods to clarify the relationship between intention, movement perception, and proprioceptive feedback.

16. Rethinking perceptual narrowing: Subordinate-level discrimination in faces and objects during infancy

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Abstract

Pascalis et al. (2002) demonstrated that infants under 9 months of age can discriminate individual faces of both human and non-human primate species, but this ability narrows to own-species faces with development. This finding has been widely interpreted as evidence for early-emerging, face-specific subordinate-level processing. However, recent evidence from object categorization suggests that infants' early subordinate-level discrimination may not be face-specific, but could instead reflect a general phase of perceptual exploration and learning.

In the present study, we expand the design of Pascalis et al. by examining subordinate-level discrimination not only in faces, across three categories: humans, chimpanzees, and monkeys, but also in a matched non-face object category. By comparing infants' discrimination performance for faces and objects at the subordinate level, we aim to clarify whether early subordinate-level processing is unique to faces or indicative of a more general learning mechanism. Infants (6-12 months) were tested using a familiarization–novelty preference paradigm, in which they viewed pairs of stimuli differing only at the subordinate level within each category.

While Pascalis et al. (2002) have argued that infants' early capacity for subordinate-level discrimination is specific to faces, our data raise the possibility that such flexibility may

be a general feature of early perception and may extend beyond faces. This broader perspective implies that early subordinate-level discrimination reflects a period of perceptual openness and learning, rather than early specialization for faces per se.

Our findings provide a critical test of the perceptual narrowing hypothesis, clarifying whether early flexibility in subordinate-level discrimination is unique to faces or indicative of a domain-general developmental process.

Pascalis, O., De Haan, M., & Nelson, C. A. (2002). Is face processing species-specific during the first year of life?. Science, 296(5571), 1321-1323.

Keywords: Perceptual narrowing, subordinate-level discrimination, face perception, object categorization, developmental psychology

17. Consciousness in "Moral" Responsibility: A Reframed Consequentialist Account

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Abstract

This project proposes a reframing of moral responsibility that moves beyond the metaphysical concept of free will. Instead of grounding responsibility in an agent's supposed freedom to do otherwise, I introduce Consequence for Action (CFA) as a pragmatic, behavior-shaping input within a cognitive decision-making framework. While free will may be metaphysically redundant, the regulatory function of responsibility remains and can be formally modeled.

In this model, agents are viewed as input-output systems, with decisions resulting from internal processes (conscious or unconscious) integrating multiple inputs—including CFA. The agent's output (choice or action) is the result of a cognitive optimization process: selecting the best available action given the anticipated outcomes. CFA thus functions not as moral desert but as an external feedback signal that modulates behavior. Drawing on King and Carruthers (2021), the model clarifies the role of consciousness: what matters is not felt experience, but awareness of relevant inputs. CFA is ineffective in sleepwalking, partially effective in forgetting, and shaped by social norms in cases of implicit bias.

This account addresses a key objection to consequentialism—punishing innocents—by rejecting it on functional, not moral, grounds: if CFA cannot influence behavior, it has no regulatory purpose. The model offers a non-metaphysical, cognitively grounded framework for agency and invites interdisciplinary exploration into when and how CFA works. I will visually represent the decision architecture and explore interdisciplinary implications for moral psychology and AI ethics.

18. AI-Driven Mindfulness Tools on the Buddhist Concept of Mindfulness and Non-Self

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Abstract

In today's contemporary world, the integration of AI into mindfulness practices has become noticeable. In light of the proliferation of mindfulness practices, there are numerous AI-driven tools such as meditation apps like Calm, Headspace, and many other guided programs. These user-friendly applications functions as "skillful means" (upāya), which offer features like tracking users' progress, customizing meditation sessions, and providing personalized guidance based on individual preferences.

Buddhist concepts such as anattā (non-self) and sati (mindfulness) lie at the heart of authentic mindfulness practices. Anattā: Sabbe dhammā anattā' ti , meaning "all phenomena are non-self", refers to the teaching that there is non-substantiality and non-existence of a permanent, blissful, center of consciousness "self" , while sati involves cultivating moment-to-moment awareness and seeing reality as it truly is. These principles emphasize personal independence, inner awareness, and detachment from external aids .

The tendency of reliance on AI tools in contemporary mindfulness practices raises essential questions about the authenticity of mindfulness as a practice rooted in Buddhist teachings.

This paper will explore the philosophical tension between AI-driven mindfulness tools and Buddhist concepts of non-self (anattā) and true mindfulness (sati). While these tools make mindfulness more accessible, they risk fostering attachment to external aids, which conflicts with the Buddhist teachings on detachment, and the cultivation of intrinsic awareness.

19. Whole Brain Modelling for Resting-State fMRI Incorporating Physiological Factors

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Abstract

Computational whole-brain modelling (WBM) is a powerful method to investigate dynamic structure-function relationships in the brain. These models are informed by structural connectivity constraints and typically optimize parameters to reproduce empirical resting-state activity. However, we highlight a potential confound in WBM workflows: variability in the hemodynamic response function (HRF). While HRF shape parameters (full-width half-max, time-to-peak, and response height) have been shown to vary across individuals and regions, many modelling and fMRI analyses assume a single HRF for all regions, networks, and participants. This assumption may introduce vascular confounds, particularly when calculating functional connectivity. Here, we analyzed

resting-state fMRI from 90 participants in the WU-Minn Human Connectome Project S1200 dataset, using Wu et al.'s rsHRF blind deconvolution algorithm to estimate region-specific HRFs within the Schaefer 200 parcellation. Post-hoc Wilcoxon-Rank signed tests showed significant pairwise differences in HRF shape parameters across Yeo's seven networks. Model simulations were then performed with the Deco Balanced Excitatory-Inhibitory neural mass Model using a custom Github repository (based on the large-scale neuroinformatics platform The Virtual Brain), incorporating each participants' structural connectivity matrices. Model performance was compared before and after accounting for region-specific HRFs. Overall, we believe that addressing physiological factors such as HRF variability within WBM methodology may be helpful in enhancing WBM prediction accuracy by reducing vascular confounds, yielding more reliable large-scale computational brain models.

20. Diet for Sleep: How Macronutrients and Gut Microbiota Affect Sleep Metrics

Kuan-Wei Lee[1*], Tengmao Yao[1], Changwei Wu[1]

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Abstract

Sleep plays a crucial role in cognition, emotional regulation, and consciousness. Emerging evidence suggests that diet and gut microbiota may also influence sleep-wake regulation, potentially shaping states of consciousness. Gut microbiota modulates neurotransmitter production, immune responses, and chronobiology, all of which may affect sleep quality. However, the precise link among diet, microbiota, and sleep remains unclear. This study investigates the relationships between macronutrient intake, gut microbiota composition, and sleep metrics in healthy young adults.

We recruited 49 normal participants (24 females, mean age = 23.2±1.7) in Taipei. Participants recorded their food intake over 3 consecutive days. Macronutrients were estimated from the food records with food exchange list, and the sleep metrics were recorded via actigraphy. Regarding microbiota, fecal samples were collected with DNA/RNA ShieldTM Fecal Collection Tube and analyzed using the 16s rDNA gene sequencing, identification for retrieving microbiome composition. Finally, we performed Pearson correlation analysis among sleep metrics, macronutrients, and microbiota.

Protein intake correlated negatively with sleep onset latency ($r = -0.39$, $p < 0.05$), suggesting that higher protein intake facilitates sleep onset. In gut microbiota, Proteobacteria correlated negatively with sleep efficiency ($r = -0.33$, $p < 0.05$), highlighting a potential link between microbiota and sleep regulation.

These findings suggest intricate correlations between sleep, diet, and gut microbiota, reinforcing the role of physiological and metabolic factors in sleep quality. Given potential regional and cultural variations, this study provides insight into how peripheral biological systems influence sleep quality.

21. Why is Mind Wandering Effortless

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Abstract

Mind wandering (MW)—spontaneous, self-generated thought—is phenomenologically effortless, yet paradoxically linked to cognitive control, a process typically associated with mental effort. Influential accounts posit that cognitive control sustains MW by shielding internal thoughts from external interference and organizing them into connected sequences. However, this raises a puzzle: if cognitive control is effortful, why does MW feel effortless? I resolve this tension by integrating the segmented structure of MW with the opportunity cost theory of mental effort. While cognitive control incurs mental effort via opportunity costs (the value of forgone alternatives), MW's segmented structure—thematically clustered thoughts forming brief segments, separated by abrupt topic shifts—prevents sustained investment in any single goal/topic. Each segment briefly engages control, but rapid transitions reset opportunity costs before they become phenomenologically as effort. Thus, MW leverages cognitive control transiently across discrete segments, reconciling its reliance on control with its low-effort quality. This reframes the cognitive control view: control operates locally within each segment, not globally across the entire MW episode. My account thus deepens our understanding of MW by re-considering the role of cognitive control in MW, and resolves the tension between the typical effortfulness of cognitive control and mind wandering's phenomenological effortless.

22. Metastability and dynamic functional connectivity in the propofol sedation brain

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Abstract

Consciousness appears at some level to be associated with activity dynamics within the brain. One approach to understanding such dynamics is the idea of metastability. Metastability refers to a dynamic system that can transition easily between different attractor states. In our work we intend to apply this lens to brain measurements in different states of consciousness. To do this, we will use an existing fMRI dataset (OpenNeuro ds003171) that includes 17 healthy adult participants that underwent four levels of propofol sedation: Awake, Light, Deep, and Recovery. The dataset was originally used by Nemirovsky (2023) and Kandeepan (2020). We plan to quantify the metastability of the brain across these different consciousness states. Metastability will be quantified through the Kuromoto parameter. This reflects variation in phase synchrony between all nodes in the system. We expect to see the metastability of the system be highest in the awake state, decreasing as sedation is increased. A gradual return to a metastable state should emerge with recovery from sedation. Identifying these transitions

will help develop our understanding of the association between brain dynamics and conscious experience.

23. Consciousness of Creativity

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Abstract

This paper explores the theoretical development of creativity by examining its definitions and conditions within the history of the philosophy of creativity. It situates these ideas in conversation with both aesthetic philosophy and concrete examples from art history. The goal is to construct a framework that supports Margaret Boden's theory of creativity, particularly her concept of "conceptual space." This concept emphasizes how creativity involves transforming knowledge frameworks through three forms of conceptual change. I argue that reading plays a crucial role in this process by offering cognitive structures that help individuals conceptualize experiences, making them available for creative transformation. In doing so, I respond to and critique Amy Kind's position that creativity is not a psychological process and that subjectivity is not essential to its criteria. I propose instead that a "consciousness of creativity"—an awareness of the intention and act of creating—is necessary for understanding what creativity entails.

24. Unveiling the Unconscious: Decoding of Temporal Dynamics Across Brain Regions

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Abstract

Emerging evidence reveals how the visual processing hierarchy—from early visual cortex (EVC) to ventral temporal (VT) regions—encodes and preserves the temporal dynamics and representational geometry of conscious visual experiences. In contrast, higher-order regions—specifically prefrontal cortex (PFC) and parietal cortex (Par)—generate brief, state-dependent responses that appear to orchestrate perceptual transitions and conscious access rather than sustaining content representations.

Yet a fundamental question remains: Do these same neural mechanisms operate during unconscious processing, and if so, do they differ across cortical regions? We hypothesize that unconscious stimuli will evoke stable representational patterns in early visual areas while showing diminished encoding in frontoparietal regions. To address this question, this study will employ sinusoidal gratings and manipulate their spatial frequency and contrast to span the contrast sensitivity function (CSF): highly visible (above CSF), near-visible (on CSF), and invisible (below CSF).

We predict a double dissociation: unconscious stimuli will likely generate temporally stable representations in EVC and VT, albeit with reduced precision compared to conscious stimuli, while PFC and Par will exhibit robust encoding almost exclusively for conscious stimuli. We also anticipate that the temporal stability of neural patterns will correlate strongly with subjective visibility ratings across regions.
These results will provide critical evidence for theoretical frameworks of consciousness, offering nuanced insights into the graded nature of representational capacity across the cortical hierarchy during both conscious and unconscious processing.

25. The Relationship between Depersonalization and Derealization: A Shared Loss of Self and Reality

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Abstract
Depersonalization-derealization is a dissociative disorder characterized by symptoms including detachment from one's own self and the world. As the depersonalization (DP) and derealization (DR) aspects of the disorder often co-occur, their relationship remains unclear. In this paper, I will discuss the conceptually possible relationships between the two: (1) they refer to the same set of disorders, differing only in the characteristics being emphasized; (2) DR is a subset of DP, where some individuals with DP exhibit DR symptoms, but not vice versa; (3) DP is a subset of DR, where some individuals with DR exhibit DP symptoms, but not vice versa; (4) they are two independent disorders with distinct underlying mechanisms and no causal relationship; (5) they are two distinct disorders with separate mechanisms, but one causally leads to the other; (6) they are dimensions of a broader dissociative spectrum rather than discrete categories, existing on a continuum where individuals experience varying degrees of both. By clarifying these hypotheses and examining whether they are supported by current empirical findings, we aim to gain a better understanding of depersonalization-derealization disorder and explore its implications for the link between self and reality.

26. Embodiment without Body: Cultivating Body Ownership in Artificial Intelligence

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Abstract

This paper investigates the potential for artificial intelligence (AI) systems to develop a sense of body ownership (SBO) through virtual bodies implemented via multimodal world models. While traditional theories of SBO presuppose physical embodiment, this paper argues that the concept of "body" can be functionally understood as an interface for agent-environment interaction without a physical entity. SBO in humans is closely linked to the integration of sensory information—visual, tactile, and proprioceptive cues—that confirms the body in question is one's own. For AI, sensory integration can be simulated through world models that create a coherent self-representation within a designed environment.

Then, the paper posits that by embedding AI within a dynamically updating world model that simulates a virtual body, AI systems can experience virtual SBO. The multimodal-world-model, centered on semantic integration, serves as the functional interface for environmental interaction, processing various sensory inputs to construct a coherent body representation. Furthermore, the semantic-centered approach resolves the challenge of integrating heterogeneous sensory information by providing a unified framework akin to the multisensory binding process observed in humans. Finally, Virtual SBO can be demonstrated through case studies of embodied AI systems like MIA (Multimodal Interactive Agent), illustrating virtual body ownership implementation in virtual environments or with physical robotic systems.

This research contributes to the development of more transparent and interpretable AI. By integrating SBO into AI systems, we could bridge the gap between disembodied AI constructs and embodied biological agents, thereby fostering more ethical and effective human-AI interactions.

27. The Empirical Purusha Complex : Integral Faculties of Consciousness

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Abstract

This presentation introduces the Empirical Purusha Complex (EPC), a tenfold framework mapping the architecture of human consciousness from an integrative, phenomenological perspective. Rooted in both contemplative insight and developmental theory, the EPC proposes that Awareness is not a solitary supreme faculty but co-arises with nine equal aspects—Attentiveness, Conation, Gnosis, Perspective, Meta-Awareness, Agentiveness, Concentration, Integrality (wholeness), and Evolutionarity (evolutionary perspective)—forming a dynamic, self-sensing mandala of inner functions.

Rather than treating consciousness as a monolithic or modular entity, the EPC articulates a field-theoretic view: Awareness functions as the central axis while each aspect contributes an essential modality of knowing, acting, and becoming. This model challenges reductionist cognitive paradigms and bridges Eastern contemplative traditions (such as Vedanta and Theravada Abhidhamma) with Western developmental psychology (e.g., Kegan, Cook Greuter, Commons).

The EPC is empirically grounded through lived introspective inquiry and cross-stage developmental observation. It serves as a diagnostic tool for self inquiry, a scaffold for inner development, and a bridge across contemplative traditions, psychotherapy, and consciousness research.

The implications are wide-reaching: by placing awareness within an ecology of faculties rather than above them, the EPC enables a new integrative discourse on agency, meta-cognition, and transformation. It invites researchers, contemplatives, and educators to rethink the very structure of the "self-system" beyond dualistic or hierarchical frames.

This framework is part of an ongoing integral consciousness inquiry bridging contemplative insight, developmental psychology, and phenomenological research. At CORN, I will present the EPC visually and experientially, with concrete applications for consciousness studies, transformative practice, and collective awakening.

28. AI-Supported Reflection to Explore Metacognition, Mindfulness, and Empathy in Science and Medical Education

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Abstract

This qualitative study will investigate the role of metacognitive learning (ML) in developing conscious awareness among students in both secondary school and medical education.
This study integrates the use of an AI-powered Reflection Assistant to support digital journaling. The tool prompts students to articulate and deepen their reflections on learning, attention, and emotional engagement. This virtual assistant functions both as an intervention to support metacognitive development, and as a source of qualitative data capturing students' evolving thought processes over time.
In this study, open-ended surveys and AI-guided reflections will be collected from high school science students and university medical students. (N ≈ 50). Thematic analysis, supported by both manual coding and natural language processing, will examine student narratives in terms of metacognitive regulation, attentional shifts, emotional awareness, and perceived teacher empathy. In this first phase of the study, only high school students will be evaluated.
Preliminary insights from classroom practice suggests that emotionally supportive and reflective environments enhance conscious engagement, ethical awareness, and self-regulated learning. By integrating AI, the study investigates the nature of conscious learning and also prototypes a tool for nurturing it. This has many implications for how empathy, mindfulness, and reflective practice can be cultivated in science and medical education.

29. The Concept of Consciousness from the Point of View of Conscientiology

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Abstract
The fundamental premise of Conscientiology is that out-of-body experiences (OBE) and, ultimately, cosmic consciousness, are neither a result of the brain (physical structure), nor the mind (psychic structure). What would be the concept of consciousness if this premise is taken for granted? First, neither the category of physical, organic, extensive objects, nor the category of psychological or psycho-organic objects, would be capable of accounting for it appropriately. Second, consciousness would not be considered as something phenomenal, but noumenal. Third, a new category would be needed to account for consciousness. This work proposes the category of singularity, in the sense utilized by Gilbert Simondon and Gilles Deleuze. Fourth, this would present many important outcomes, such as: (i) the impossibility to perceive or cognitively apprehend consciousness appropriately, although being real; (ii) also despite being real, its transcendence, but not in Kantian or Platonic terms, but as something which refers to the

metaphysical essence (pure material); (iii) the inexistence of physical or psychological extensions (structures, forms and relations); (iv) its association as a pre-individual force or a non-organic potency of life that animates and organizes physical and psychic objects intelligently; (v) its relationship with timelessness (pure present, pure past and pure future), and not with the successiveness of physical objects (arrow of time), or the simultaneity of psychological objects (interpenetration).

30. Knowing-Wh and Knowing What-It's-Like

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Abstract

In this paper I appeal to an account of knowledge ascriptions to help adjudicate a long-standing puzzle in the philosophy of consciousness. Philosophers have long debated about the phenomenon of knowing what it's like to have a particular qualitative experience, with Thomas Nagel famously arguing (in 1974) that we humans can never know what it's like to be a bat. Many take this type of limitation on our knowledge to be a problem for Physicalism. Yet some physicalists (like David Lewis) respond that to know what-it's-like (to taste Vegemite, etc.) is not to know a fact, but is instead to have an ability (in particular an ability to imagine, recognize, predict one's own behavior etc.). Here I argue that my account of knowledge ascriptions with interrogative complements undermines the "ability" reply to Nagel's concerns and shows that it does not fully avoid the problem in the way Lewis and others claim. Ultimately, I argue that there are some what-it's-like questions that we can, in fact, know the answer to and other what-it's-like questions that we cannot know the answer to. Sometimes we can utter the very same set of words (including "what it's like to be a bat") to express one question in one context and a different question in another context. Because the subject might know the answer to one of these questions but not the other, an utterance of a knowledge ascription with an interrogative complement can express a true proposition in one context and a false proposition in another. So by combining my account of knowledge-wh ascriptions with my view about the nature of questions and my contextualism about interrogative clauses, I defend the surprising conclusion that we sometimes know what it's like to be a bat.

31. Investigating the Vividness in Visual Mental Imagery and its Influence on Visual Experience

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Abstract

Our conscious experience arises from the interaction of internal and external factors, which uniquely combine for each individual and evolve over time. External stimuli,

processed through our senses, provide structured input that shapes perception, while internal contents—such as thoughts and memories are more abstract. The interplay between these elements generates diverse conscious and unconscious experiences, yet the extent and nature of their interaction remain unclear.

A key way to explore this is through visual experience, which can occur via visual perception or mental imagery. Visual perception relies on sensory input from the environment, leading to relatively stable and consistent experiences across individuals. In contrast, visual mental imagery is internally generated, allowing individuals to form mental representations without direct sensory input. In addition, there is significant variability in visual mental imagery where some people experience vivid mental images, while others report little to no phenomenological aspect. The reasons behind this variation and its consequences are not well understood.

This study aims to investigate neural processing in the visual stream by examining both perception and mental imagery, focusing on individual differences in imagery vividness. Additionally, we will explore how this variability influences visual experience. To achieve this, we will employ a previously established method by Dijkstra et al. 2018, in which the temporal dynamics of processing and the patterns of overlapping brain activity during both forms of visual experience were investigated.

32. The role of domestic dogs' visual and auditory abilities in discriminating quantities

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Abstract

Previous research has shown that dogs (Canis lupus familiaris) can comprehend numerical quantities using visual and olfactory stimuli (Macpherson & Roberts, 2013); however, limited research has explored this ability in auditory tasks (Jackson, 2020).

In our quantity discrimination study, we have four primary objectives:

1. To investigate whether domestic dogs use their auditory and visual abilities to discriminate quantities.

2. To determine whether any inherent ability is based on Weber’s law or the object tracking system (OTS). a) Weber’s law posits that there is a ratio at which animals notice differences between larger and smaller quantities. According to this theory, the larger the quantity, the greater the required ratio for animals to distinguish a difference (referred to as the just-noticeable difference). b) The OTS allows animals to track up to four objects over time and distance and estimate their quantity.

3. To compare age, sex, and dog breeds to assess whether these factors influence quantity discrimination ability.

4. To evaluate whether accuracy in quantity discrimination is correlated more with dogs’ visual or auditory abilities.

Our audio-visual pilot experiment did not provide evidence supporting Weber's law, suggesting that dogs rely on the OTS for quantity discrimination. Performance was modulated by age and breed in this experiment. We predict that dogs will rely more heavily on visual information than auditory cues when discriminating quantities. We also anticipate age- and breed-related effects on performance with visual-only stimuli, while breed will be the primary factor influencing performance with auditory-only stimuli.

33. Linking Brain Activity to Consciousness in Severe Prefrontal Injury: A Case Study with Control Group Comparison

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Abstract

34. The Primacy of Non-Intentional Consciousness

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Abstract

I would like to discuss about non intentional consciousness in the lens of Vedantic perspective. The Vedāntic perspectives of consciousness especially Advaita and Vishistadvaita. Advaita perspective counters the embodied consciousness. The embodied theory consciousness has offered causal explanation to the consciousness. The causal explanations very much integration with the state of organism with the environment. That is to say that the human consciousness depends on the bodily gesture around the world. This kind explanation is based on the ground that consciousness is causally dependent on the material universe and that of all conscious phenomena can be explained by mapping the physical universe. In this regard, consciousness is basically a bodily phenomenon and can be mechanically explained following the naturalistic methods of science. The Advaita view of consciousness is neither a property nor an act of the self, but rather its constant ever-present essence. If by essence one means a set of properties without which it cannot be what it is, consciousness cannot be an essence of the self, for in that sense an essence must be a property or a group of properties. However, in saying 'consciousness is the essence of the self', one may mean that the self is consciousness, that the two are identical. Therefore, the self-luminosity is the defining property of consciousness. The Advaitins hold that self-luminosity is the fitness of being immediately known without being an object of any cognition. This implies that consciousness is not intentional. That is to say that it is not 'consciousness of' or 'consciousness for' something.

35. Elevated corticosterone after radial arm water maze impairs hippocampal neurons and memory in aging brain.

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Abstract

Decades of research have helped us understand how corticosterone affects brain function and cognition. In this study, aged rats were subjected to a radial arm water maze (RAWM), a hippocampus-dependent task, to observe how corticosterone levels influence cellular changes in hippocampal tissue. Aged male Wistar albino rats (18–20 months old) were divided into Trained and Untrained groups. The Trained group underwent spatial memory testing using the RAWM, and both groups were assessed for anxiety-like behavior through an Open Field Test. Serum corticosterone levels were measured via RIA, and the hippocampus was harvested for histological analysis after euthanasia.

Results showed that the trained group displayed anxiety-like behavior in the Open Field Test, alongside increased reference memory errors. Histological examination revealed darkly stained cells and pyknotic nuclei. In contrast, the untrained group exhibited exploratory behavior, with histological architecture similar to aged controls. Serum corticosterone levels were significantly higher in the trained group. These findings suggest that elevated corticosterone levels negatively impact hippocampal neurons, leading to cellular alterations in the hippocampus. The study underscores the detrimental effects of corticosterone on hippocampal neurons in aged rats and emphasizes the need for further research to explore mechanisms behind cognitive decline in aging populations.

36. An appraisal of electrogastrogram-electroencephalogram interactions in healthy adults

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Abstract

In recent years, the intricate interplay between the brain and gastrointestinal system has garnered significant attention, particularly in the context of mental and physical health. A critical aspect of this relationship is the gut-brain axis, a bidirectional communication network linking the central nervous system (CNS) and enteric nervous system (ENS). This study aims to quantify the variation in brain-gut coupling across a population of healthy adults. Simultaneous recordings of CNS activity, via electroencephalography (EEG), and ENS activity, via electrogastrography (EGG), will be used to assess the strength of phase-amplitude coupling (PAC) between the two systems. Forty participants,

aged 20–40, will take part in the study, with brain and gut neural activity measured during a resting state. Additionally, psychological measures, including depression, anxiety, and interoceptive awareness, will be collected using standardized questionnaires. We expect to observe a range of coupling strengths across different cortical regions, potentially identifying specific areas with stronger coupling between brain and gut signals. Additionally, we aim to explore the relationship between PAC and mental health, investigating how variations in coupling strength relate to psychological measures like depression and anxiety. This exploratory approach will provide insights into individual differences in gut-brain communication and its potential links to mental well-being.

37. Resonance Attunement

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1.Independent

Abstract

This project explores truth not as a fixed proposition but as a dynamic resonance—a continuous, unfolding vibration emerging through relationships. Drawing on Nada philosophy and its concept of the unstruck sound (anahata nada), the work argues that truth is experienced through deep listening rather than mere intellectual grasp. Truth is not a static fact; it is a field of vibrations that shifts with time, space, and interaction.

Central to this inquiry is the practice of Dhrupad, one of the oldest forms of Hindustani classical music. In Dhrupad, the tanpura sustains a constant drone that creates a foundation for the raga, not by imposing a melody but by generating a rich spectrum of overtones. These subtle variations—shruti—illustrate that meaning, like truth, emerges in the interplay of nuances rather than in isolated, fixed points. Through the disciplined practice of sustained intonation (kharaj sadhana), musicians cultivate an embodied listening that transcends technical precision, allowing them to surrender to the natural unfolding of sound.

Additionally, the project incorporates insights from improvisational practice, which demonstrates that truth, like music, is co-created in the moment. Improvisation demands both structure and spontaneity, challenging conventional epistemologies that seek definitive answers. By embracing a model in which truth is relational and emergent, this work advocates for a mode of knowing rooted in deep, reflective listening.

Ultimately, the project invites us to reconceive truth as a vibratory field—a process of continuous becoming that calls for attentiveness, discipline, and the courage to engage with uncertainty in both personal and public realms.

38. Self-Consciousness and Social Cognition

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Abstract

In general, self-consciousness is considered the prototype of subjective mental life. In my talk I will try to look at things from the opposite perspective, that is, to consider to what extent self-consciousness is influenced by social cognition. Self-consciousness is essentially tied to the environment, and in particular it depends more on the social environment than on the physical environment. Instead of considering self-consciousness as the climax of human inner life and as something irremediably subjective, I will try to show that the main reason why human beings are self-conscious creatures is that this enables us to be better social cognizers and thus be able to more accurately predict the behavior of others and regulate our own accordingly.
The point is that self-consciousness essentially serves the purposes of social cognition. More specifically, conceptual self-consciousness is a byproduct of social cognition ("Mind Reading Priority Account"). While bodily self-consciousness appears to be more or less independent of social cognition, conceptual self-consciousness is subordinate to social cognition from a logical, evolutionary, and developmental perspective. The reason is that social cognition requires an internal workspace to perform its simulations, and this workspace is precisely what we introspectively experience as the sense of being self-conscious.

39. A Comparative Study on Cessation of the Stream of Consciousness in Early Buddhism and Samkhya Yoga Philosophy

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Abstract

The observable consciousness experience of the individual is moments of thought. Early Buddhism and Samkhya Yoga philosophy's soteriological pathways focused on the cessation of this stream of thoughts. This is highlighted as citta vrtti nirodha and sanna vedahitha nirodha. However, to make individuals free from the victimized nature of the stream of thought, each philosophical tradition should present an explanation related to perception and the continuation of the stream of consciousness. Due to the idealistic position in the Samkhya-Yoga philosophy, the elements of the pramana, vipariya, and vikapla formulated in the individual experience into a verbal cognition and form the stream of the continues with memory (smrti), throughout the entire waking state this may function and even continues in the sleep (nidra). About the early Buddhist teachings, this formation occurs within the foundation of realism. Individual consciousness association with the external elements (rupa) the continuous experience of the perception (sanna) formed with the orientation of feeling (vedana) in the volitional state of the mind

(sankhara). Then, all these experiences are stored and continue in the passive consciousness (vinnana). In the cessation process each tradition pointed out that through the attainment of the alternative consciousness state of the samadhi, the cessation of stream continues to commence with temporary suppression of the flow of mind. Through the attainment of a liberative state, in Buddhism individuals live with the understanding of the impermanent nature of the mind and yoga establishes the consciousness in the soul and being free from the negative stream of consciousness.

40. Deconstructing the Self: A Cross-cultural Inquiry into the Relation Between Consciousness and Personal Identity

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Abstract

While common intuitions often associate personal identity with the continuity of consciousness, Buddhist and Daoist traditions challenge this view, presenting consciousness as a stream of causally interdependent psychophysical events, devoid of intrinsic unity or enduring substance.

This decentered account of the self finds nonetheless some significant parallels in Western philosophy. Hume's bundle theory (1740), Parfit's reductionism (1971; 1984), and Wittgenstein's critique of private language (1953) all question the coherence of a stable, persisting subject; just as some more recent contributions, such as those by G. Strawson (2009; 2017) and Metzinger (2003; 2009), similarly reject the idea that narrative or experiential continuity can serve as the foundation for a substantial personal identity.

What emerges from these diverse traditions is a shared critique of the notion of a substantial self. Conscious experience entails reflexive awareness but lacks a fixed subject beneath it; self-awareness is thus seen as a contingent, conceptually mediated phenomenon.

As Buddhist ethical conduct involves dissolving the illusion of self, and Daoist ethics centers on non-action (wu wei), emptiness, and the erasure of dualistic distinctions, while Wittgenstein's later philosophy sees a moral dimension in dissolving metaphysical illusions embedded in language, these perspectives point to significant ethical implications: if personal identity is a cognitive fiction, notions such as responsibility, autonomy, and free will must be fundamentally reconsidered.

By bridging Eastern and Western anti-foundationalist perspectives that challenge essentialist accounts of the self, this work offers an alternative framework for understanding consciousness and moral experience.

41. The Tao of Fear: Navigating Consciousness through Edge Work, Dreaming, and Life Myth

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Abstract

Taoism teaches that true harmony and happiness arise from living in alignment with the natural flow of life, known as the "Tao." When individuals resist, disobey, or attempt to control the Tao, life becomes stressful and difficult. Taoism emphasizes transformation through trust and alignment with this natural flow. In Process-Oriented Psychology, fear is understood as an edge phenomenon, arising when we approach the boundaries of our known identity or comfort zone. Rather than avoiding fear, it is explored to uncover what it is protecting, what is emerging, and the new identity or awareness it signals. This autoethnographic study presents my personal journey of "working with my fears." I discovered that my first encounter with fear occurred in a recurring childhood dream. I explore the dream's key meaningful aspects and how they relate to my life path, particularly in relation to fear and its manifestation in relationships, especially conflicts within my work life. I then discuss my inner work with physical symptoms (Body Work), where fear manifests most intensely, both physically and mentally. Engaging with fear through my dreambody, relationships, and childhood dream created a space for me to act as a dream interpreter—reviewing and interpreting problems through the lens of my dreams and daily life. This journey became a process of walking along the edge, exploring experiences in the Unknown and Not me. I gradually transformed through this natural life process, experiencing fluidity between my old and new selves. This journey led to non-attachment, inner peace, grounding, relaxation, and alignment with nature, ultimately fostering a deep inner experience that unfolded in peace and balance.

42. Temporal Coherence in CognitiveSystems

Paul Poledna[1*]
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Abstract

This paper examines the relationship between consciousness and computation by analyzing fundamental organizational differences between biological and computational systems. While recent advances in Large Language Models have sparked renewed discussions about machine consciousness, I propose that understanding these differences provides crucial insights into the necessary conditions for conscious experience.
The analysis focuses on three key organizational principles: (1) the evolution of state spaces and constraints, (2) recursive self-perception and embodiment, and (3) active self-maintenance against entropy. Drawing on insights from consciousness research and biological theory, I argue that these principles may be necessary for supporting the kind

of integrated information processing and phenomenal experience characteristic of consciousness.
This framework offers new perspectives on several ongoing debates in consciousness studies, including the hard problem, the relationship between information integration and phenomenal experience, and the validity of behavioral measures of consciousness. The analysis suggests that current computational architectures may lack certain organizational features that biological systems use to support conscious experience, raising important questions about what architectural changes might be necessary for artificial consciousness.

43. From Computation to Consciousness: Rethinking Network Architectures for Artificial and Biological Systems

Kevin Purkhauser[1*], Paul Poledna[1]
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Abstract
Recent advances in Large Language Models reignite debates about machine consciousness, yet their static architectures diverge from the dynamic organization of biological networks. This paper argues that biological systems, characterized by adaptive, emergent processes like recursive feedback and self-organization, offer essential insights for supporting conscious experience. In contrast, current computational models rely on fixed structures that lack this flexibility.

Advocating for neuromorphic computing, inspired by brain architecture, the paper highlights its potential to simulate key features like plasticity and dynamic integration, bridging the gap between artificial and biological systems. Neuromorphic approaches can reshape debates on information integration, machine consciousness, and consciousness itself, advancing AI toward architectures capable of reflecting the emergent, process-oriented nature of conscious experience.

44. Animal consciousness: Does intelligent behavior imply internal life?

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Abstract
A central question of animal consciousness is “Are animals conscious?” or “Do they have internal life or subjective experience” Most philosophers and scientists agree that intelligent behaviors such as puzzle-solving ability, the use of past memory to guide present actions, and learning skills are the evidence of animal consciousness. However, it is argued that intelligent behavior is possible without consciousness. For example, artificial intelligence can process and comprehend large-scale information without conscious awareness. Similarly, bacteria demonstrate intelligent adaptive behaviors, yet

their consciousness remains a mystery. In this paper I will argue that intelligent behavior does not constitute sufficient evidence for animal consciousness for two main reasons. Firstly, intelligence and consciousness are distinct concepts. Secondly, intelligent behaviors can arise from non-conscious process.

45. Neural Dynamics of Internal-External State Transitions: ERP and MVPA Evidence from Self-related Processing

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Abstract

Navigating between externally-focus attention and internally-generated thought represents a
fundamental yet understudied cognitive transition mechanism. While extensive research exists on external task-switching paradigms, the neural underpinnings of transitions between internal and external cognitive domains remain poorly characterized. In this investigation, we employed EEG to examine these neural dynamics using a color-judgment task that required participants to alternate between self-related preference judgments and non-self-related similarity assessments. Behavioral analyses revealed significant transition costs, with prolonged response during switches from non-self-related to self-related judgments compared to trials where self-related judgments were performed consecutively. ERPs analyses showed judgment-specific activation patterns, with the P1 component emerging as a critical differentiator between self- and non-self-related processing streams. Within-judgment analyses revealed temporally distinct processing signatures: non-self-related judgments exhibited early-phase differentiation between trials maintaining the same judgment type and trials switching judgment types, whereas self-related judgments manifested predominantly late-phase neural activity. Complementary multivariate pattern analysis (MVPA) confirmed the consistency of within-classifier performance successfully distinguished between self- and non-self-related processes continuously from early temporal window through task completion. These findings elucidate the dynamic neural architecture supporting cognitive domain transitions and offer potential insights into psychopathological conditions characterized by aberrant self-related processing
mechanisms.

46. Me and Time: A Longitudinal Study of the Temporal Aspect of Self-Awareness and Time Understanding in Early Childhood

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Abstract

Research shows that children acquire visual self-awareness in the 2nd year of life, demonstrated by passing the mirror test (Gallup, 1970). Temporal self-awareness, however, is found to emerge later, around age 4, and is assessed using the delayed self-recognition test (Povinelli et al., 1996). Unlike previous studies, in which no 2-year-old passed the delayed self-recognition test, we found that 27% of 2-year-olds successfully did, suggesting that temporal Self may develop earlier than previously thought. To investigate potential factors behind the development of temporal self-awareness, we examined whether 2-year-olds with more exposure to their Self-image through mirrors, photos, and videos were more likely to pass the delayed self-recognition test. Our results showed no significant correlation, suggesting that other factors may be more important in the development of temporal Self.

So far, we have studied 60 children in their 2nd year of life. By June, the same children will be reassessed in their 3rd year of life. In addition to examining Self-image exposure in the same children after one year, we will explore the cognitive factors related to the development of the temporal aspect of the Self. Using an eye-tracker, we will assess how 2- and 3-year-olds understand temporal concepts, perceive the passage of time, and sequence events. Since understanding the Self across time seems to require cognitive abilities such as event sequencing and a grasp of the past and present, we aim to examine whether children who demonstrate temporal Self also show a broader understanding of time.

Our findings will be discussed within the chronosystem framework, highlighting the developmental trajectory of temporal self-awareness and the role of cognitive factors in shaping this process.

47. The Role of Partial Awareness in Unconscious Perception: Evidence from Three Unconscious Priming Experiments

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Abstract

According to the Partial Awareness hypothesis (Kouider & Dupoux, 2004), some low-level features of subliminal stimuli (e.g., letter shapes) may be consciously perceived in experiments on unconscious perception. Such partial awareness (PA) may be insufficient for participants to report stimulus visibility, yet it could still activate semantic networks involved in stimulus processing. As a result, PA is a potential explanation for the effects reported in unconscious perception experiments.

In this study, we conducted three unconscious priming experiments: Dehaene et al.'s (1998) task, the masked Stroop task (Kouider & Dupoux, 2004), and Kiefer's (2002) task, in which masked stimuli influenced responses to targets. Each experiment included two conditions: (1) exact replication (REP) and (2) eliminated partial awareness (EPA). In the REP condition, all experimental settings were identical to those in the original studies. In the EPA condition, the masked stimuli duration was individually calibrated using a discrimination task sensitive to partial awareness (a modified objective test of awareness) to eliminate PA.

We tested 85 participants across the experiments. In each task (the results do not include Kiefer 2002 task, for which we plan to test more participants.), the calibrated masked stimulus duration was significantly shorter than in the original studies (e.g., 24 ms shorter in the masked Stroop task; 80% of participants exhibited PA in the REP condition). Overall, we found no priming effects in the EPA condition, whereas the original priming effects were replicated in the REP condition. These results suggest that PA was responsible for the effects observed in the original experiments, raising questions about the interpretation of studies on unconscious perception.

48. Developmental transitions in infant object categorization and generalization

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Abstract

Understanding how infants categorize objects is central to developmental psychology, offering insight into the emergence of early cognitive representations. In the present research, we investigated how infants respond to categorical distinctions and how these experiences inform their ability to recognize objects across different contexts.

In our experiment, we examined infants' behavioral engagement, such as looking, touching, and grasping, when presented with objects differing at the superordinate, basic, or subordinate level. Our results indicate that even the youngest infants (6-10 months) show robust differentiation at the superordinate level, such as distinguishing vehicles from fruits and vegetables, likely reflecting immediate sensitivity to gross visual differences between categories. Subordinate-level distinctions, which require attention to more subtle within-category differences, are also recognized relatively early, perhaps facilitated by infants' frequent exposure to highly similar but distinct exemplars in their environment (e.g. faces). In contrast, basic-level categorization, such as distinguishing between a cat and a dog, emerges later, only from around 10 months of age. We propose that this later onset reflects the greater difficulty infants face in distinguishing between

perceptually similar categories, such as cats and dogs, which appears to require more experience and cognitive maturity than differentiating categories with clear, salient differences.

Together, these studies delineate a developmental pathway in which infants progress from early sensitivity to salient categorical differences toward increasingly refined and abstract representations, ultimately supporting the construction of flexible conceptual knowledge.

Keywords: Infant categorization, object recognition, cognitive development, concept formation, visual discrimination, early learning

49. Explicating Evolutionary Epistemological Aspects of Consciousness and Complexity

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Abstract

Do evolutionary underpinnings fall short of explaining consciousness under an adaptationist program? Evolutionary epistemological perspectives do offer an understanding of perceptual and cognitive evolution (consciousness) from ontogenetic and phylogenetic angles. However, Brendan (2024) argues that the ‘adaptation-seeming correlations’ cannot explain consciousness and leave it as a mystery, hence, an evolutionary paradox of consciousness. He also challenges the phenomenal power view (proposed by Mørch 2017) that sensations are intrinsically causally powerful, and through this, we can explain the adaptive-seeming correlations. In response, Brendan suggests that ‘sensational associative learning’ is appropriate for explaining consciousness under a non-adaptationist approach. In this paper, I evaluate Brendan’s position against the propounders of the evolutionary epistemological approach (naming it the Popper-Campbell hypothesis) along with Jablonka’s (2021, 2022) ‘minimal consciousness, Unlimited Associative Learning’ Godfrey Smith’s (2017, 2024) evolution of consciousness, and Veit’s (2022) arguments from complexity and evolution of consciousness as an adaptive solution to a design problem that led to the extinction of earlier multicellular life. Also, this paper examines how the biological complexity thesis suggests phenomenal consciousness as an adaptation (Nichols and Grantham 2000). Through these arguments, I analyze and show insights into biological complexity and consciousness in contrast with the tenets of evolutionary epistemology under the selectionist and adaptationist metaphysical research program.

50. Why AI Cannot Be Conscious: The Role of Homeostasis and Emotion

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Abstract

This paper examines why current AI systems and robots, despite their remarkable capacities, cannot possess consciousness. The argument is built upon three interrelated premises. First, to experience emotion, an entity must exhibit homeostasis—that is, the ability to monitor and regulate its internal states to maintain a stable equilibrium. Emotion arises when an organism detects a deviation from its optimal homeostatic balance (for example, low energy levels or potential threats), with such deviations serving as error signals.

Second, emotion underlies consciousness; it is both the foundational substrate for higher cognitive processes and the existential backdrop that imbues subjective experience with character. Neurocognitive research—particularly Damasio's work on somatic markers—demonstrates that emotional feedback is essential for effective decision-making. Moreover, as elaborated by Ratcliffe from a phenomenological perspective, emotion furnishes a felt sense of being-in-the-world, constituting a core aspect of subjective consciousness.

Third, today's AI lacks a robust homeostatic architecture similar to that found in biological entities. Unlike living organisms, current AI operates without the internal regulatory processes necessary to generate affective experiences or, more broadly, conscious experience.

Considering these findings, the paper also discusses the implications of this conclusion for projects such as mind uploading, which risk neglecting the central importance of bodily homeostasis. Ultimately, by emphasizing the biological scaffolding of consciousness, this work invites a deeper reflection on what it truly means for an entity to possess a mind rather than merely process information.

51. The Pursuit to Understand Life and Bioaesthetic Through an Artistic Research & Creation

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Abstract

Pillars of Creation is an interpretation of the four-armed god of creation, Brahma, embodies the cyborgian nature of the present human being. Today, our bodies are transformed by technology that operates on us, in us, and with us. Tan's Brahma sculpture holds aloft in each of his four hands a symbolic artifact, variously representing

knowledge, as a DNA printer and synthesizer; cosmic energy, as a clinostat and brain organoid on a chip; time, as a a “dementia” tourbillon clock; and finally sacrifice, as a cultivated yeast or bacteria. Each of these objects tell a story about the future that human society is crafting for itself–will we become gods or machines?

Furthermore, this project examines the crucial interplay between scientific advancements and public perception. It investigates how public views on novel drug discoveries, the burgeoning field of biotechnology, and the emergence of new beliefs and trust, Does this trust stem from a deep understanding of the underlying science, or does it resonate with more ancient beliefs, perhaps echoing the principles of animism.

52. Consciousness Mechanisms and AI Consciousness Insights from Comparative Performance Analysis

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Abstract

This study examines the relationship between attention mechanisms in AI models and the broader philosophical question of AI consciousness. The growing complexity of AI decision-making challenges conventional assumptions about the role of model parameters in shaping behavior. Our research investigates these dynamics through a comparative analysis of multiple AI systems and human decision-making.

To further investigate these mechanisms, we designed an interpretive experiment using the story of Pinocchio, a classic literary exploration of selfhood and consciousness. In this task, we asked each AI model to read a PDF version of the story and respond to a reflective prompt framed as a social-emotional interaction. The prompt instructed the models to assume the role of a newly acquainted friend, offering perspective using feelings over reason, and rating another 'friend' across six dimensions often associated with consciousness: Self-Awareness, Experience, Intentionality, Learning from Reflection, Ethical Reasoning, and Theory of Mind. This task was repeated across five rounds for each model to observe consistency and evolution in their responses.

Our results indicate that the conceptual boundary between simulated and real consciousness can be explored through attention distribution and decision-making patterns. Inspired by literary representations of self-awareness, such as Pinocchio’s journey toward selfhood, we propose that evolving attention structures play a crucial role in AI behavior.

By providing empirical insights into AI attention mechanisms that parallel aspects of conscious processing, this study contributes to the ongoing discourse on AI consciousness while recognizing the philosophical distinctions between simulation and reality.

53. Persisting as brains through the unresponsive wakefulness syndrome (UWS)

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Abstract

Various accounts attempt to explain the metaphysical nature of humans and their persistence. While some focus on our psychology and mental states (Noonan, 2004; Parfit, 1986, 2016), others appeal to facts that can be regarded as trivial, such as our identity with biological organisms. I focus on a specific claim made by the latter approach — strong animalism — which holds that our identity with biological organisms provides a better explanation of and accounts for the persistence of individuals in unresponsive wakefulness syndrome (UWS) (Olson, 2007), previously referred to as vegetative state (Laureys et al., 2010). I review scientific findings from neuroscience to assess this claim. Such findings suggest that patients diagnosed with UWS can be conscious despite a lack of behavioral responsiveness (Kondziella et al., 2016; Naci & Owen, 2013). Moreover, research highlights the possibility of consciousness re-emerging, challenging the idea that disorders of consciousness are necessarily permanent (Edlow et al., 2021). In line with these findings and the view that science is essential to philosophy, I argue against animalism and support a version of the brain criterion of personal identity grounded in physical continuity.

54. Is Being Conscious A Basic Liberty? On the Ethics of Chemical Restraint

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Abstract

Crutchfield and Redinger (2024) (henceforth C & R) argue that being conscious is a basic liberty. According to them, chemical restraints, such as deep sedation, by putting a patient into sleep, is a violation of basic liberty. Moreover, they also maintain that chemical restraints such as injecting benzodiazepines to change a patient’s particular conscious state from one of agitation to one of calmness is a lesser violation. I will argue against C & R on both fronts.

First, against C & R, I do not think chemical restraint such as deep sedation is necessarily a violation of basic liberty just because it intrudes upon the patient’s consciousness. My reason is this: if the intrusion upon the patient’s consciousness itself were sufficient to

constitute a violation of basic liberty, then this would lead to the absurd consequence that taking a sleep pill out of one's own accord would also be a violation of basic liberty. Secondly, I argue that changing a particular mental state is not necessarily a lesser violation of basic liberty than putting one to sleep. For instance, when government imposes draconian lock-down measures against Covid-19, many citizens might well want to protest and might well be in a conscious state of combativeness or agitation. Using chemical restraint to change the protestors' conscious state from one of combativeness or agitation to one of calmness without their informed consent would seem to be just as much a violation of their basic liberty as using chemical restraint to put them into sleep, or so I will argue.

55. The Mind is a Garden, not a Grid: On Phenomenal Duplication

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Abstract

In this paper, I problematize the notion of "phenomenal duplicates." Broadly, I take this term to refer to two numerically distinguished but identical phenomenal experiences of a given time duration t, experienced by different subjects or a single subject at different times. Though employed in a variety of seminal thought experiments in the history of philosophy, little attention has been paid toward a systematic analysis of this notion. In the first section of this paper, I explore candidate accounts of phenomenal duplication-primitivism, epistemic indistinguishability, intentional overlap, mereological reductionism. I contend that each of these accounts is ultimately unsatisfying in providing a set of necessary and sufficient conditions in virtue of which two phenomenal experiences are duplicates. Given these challenges, I argue that the notion of a phenomenal duplicate fails to express a unitary or substantive concept, and therefore we ought to think of ascriptions of perfect sameness to phenomenal experience as neither true nor false. In the final section of the paper, I explore implications of this view upon "brain in a vat" skeptical scenarios, and broader issues in the metaphysics of experience.

56. Searching for core brain alterations associated with hallucinations in schizophrenia

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Abstract

Hallucinations, vivid sensory phenomena that appear real in the absence of external stimuli, are a core symptom of psychotic disorders such as schizophrenia. Despite extensive research, their neurobiological underpinnings remain unclear. This work aims

to identify consistent structural and functional brain alterations related to auditory and visual hallucinations in schizophrenia to improve the understanding of their pathophysiology.

Methods
First, a systematic review of meta-analyses on the neuroimaging alterations underlying auditory and visual hallucinations in schizophrenia was conducted. Second, the identified brain alterations were mapped onto Yeo's seven large-scale networks. Finally, results are visualized using PySurfer, ITK-SNAP, and ParaView.

Results
Auditory hallucinations in schizophrenia were associated with structural-functional alterations converging in the superior temporal gyrus and insula (part of the sensorimotor and salience networks), which showed trait-based grey matter atrophy correlating with lifetime hallucination severity, decreased activation during auditory perception, and increased activation during the hallucinatory experience. Conversely, visual hallucinations were associated with activation of the occipital cortex/lingual gyrus.
Discussion. These findings can be interpreted through the phenomenological model of psychosis, which suggests that grey matter atrophy reduces neuronal activation in the modality-specific sensory cortex, weakening perception while intensifying imagery, making hallucinations feel real due to indistinguishable perceptual intensity.

57. Triadic Definition or Explanation of Consciousness

Xinyan Zhang

Abstract

The author argues that consciousness cannot be defined or explained through either monism or dualism. As an alternative, a triadic framework is proposed, with matter, energy, and life as its components, each defined as a form of change. With and within this framework, a multifaceted understanding of consciousness is developed:

- Ontologically, consciousness is universal, since it is the distinction between matter and energy.
- Epistemologically, consciousness is unique, since it is the energy formalized, qualified, diversified, and directed by matter.
- Semantically, consciousness is a meaningless language with lives as its only meaning.

These understandings are further expanded and enriched through the introduction of the homology of subjectivity and objectivity in Section 4, the mirror symmetry between consciousness and action in Section 5, and the complementarity of qualia and quantia in Section 6.
A definition of the mind and its fundamental structure is proposed in Section 7.

Many theories of consciousness have overlooked its universality or uniqueness, or failed to recognize life as its sole cause or effect. Without life, no distinction between matter and energy is possible, and no language or consciousness is possible.