Dimensions of radical embodiment 3

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Beyond morphological computation: an ecological approach to control in soft robotics

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This presentation addresses a central problem in soft robotics: designing effective control strategies for adaptive behavior. Soft robots – flexible systems made of deformable materials (e.g., soft grippers) – challenge traditional control methods due to their high degrees of freedom and nonlinear dynamics. To simplify control in these complex robots, morphological computation proposes to offload computation from the brain (controller) to the body, leveraging the agent's physical properties. However, describing this process as computation is misleading: while morphology supports control, it does not take over any computation. I propose ecological psychology as a better framework to explain how morphology contributes to control. Rather than relying on computational processes, control emerges through continuous interactions between body and environment. For instance, a soft gripper conforms to the shape of an object through a reciprocal interplay between its soft material and the object's surface, without calculating the required grip strength. Ecological psychology's focus on affordances highlights how soft robots can exploit body-environment interactions to enhance their adaptability to ever-changing conditions. This talk introduces soft robotics and its control challenges, critiques morphological computation, advances ecological psychology as an alternative, and explores new ecological design principles based on affordance exploitation for creating efficient soft robots.

Ecological psychology meets political philosophy of mind

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A key assumption in ecological psychology is that the organism-environment system is the appropriate unit to study cognition. Based on this assumption, social ecological psychologists like Harry Heft have argued that a commitment to organism-environment mutuality entails the view that perception-action of affordances is socio-culturally co-constituted. Building upon this view, here we propose to go one step further, arguing that the socio-cultural co-constitution of cognition also entails a political dimension. Whereas some socio-cultural-material niches constitutively shape cognitive practices in beneficial, empowering, and cooperative ways, others do so in harmful, manipulative, or structurally unjust ways, and this calls for critical analysis from a political point of view. We contrast classical, seemingly politically-neutral examples of affordance perception in the context of the postal system with the way so-called "imperial modes of living" in Western capitalist societies shape perception-action of affordances, and through this we show that a politically neutral stance on the perception-action of affordances is unwarranted. We propose that the notions of behavior settings and cognitive institutions can be powerful tools for analyzing the political dimension of organism-environment mutuality and for aligning ecological psychology research with work in the emerging field of political philosophy of mind.

Attention in radical embodiment

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Discussions about attention are surprisingly absent from radical embodied cognitive science. Using James and Eleanor Gibson's classical work, I identify two distinct notions of attention in the ecological psychology literature, and argue that radical embodiment needs to develop a positive account of attention. I will sketch the outline of such an account.

Radical Embodiment and Cognitive Ontology

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What's the cognitive ontology of radically embodied cognitive science (RES)? Otherwise put: what are the cognitive (and psychological) kinds RECS resorts to, and how are these kinds connected to brain activities? Here, I'll try to unearth the cognitive ontology implicit (in much of) RECS. I start by distinguishing two in principle different questions discussed under the "cognitive ontology" heading: (1) What are the relevant cognitive kinds and their physical basis? (2) What is the role of the brain (and its parts) in cognition? Cognitivist answer (1) and (2) together thanks to the brain-computer metaphor. RECS, by conceiving cognition as a brain+body+word involving process, is committed to keeping them separate. I will then focus on (1), as it is most central to cognitive ontology and the most under-discussed one. Developing a thread from Anderson's After Phrenology, I will argue that the relevant cognitive kind must be (a) interaction-centric and (b) mappable on neural-bodily-and-environmental parameters. I shall argue that empirical work on affordances (e.g. Warren's work on step-ability) satisfies (a) and (b). Thus the practice of identifying affordances and their material basis constitutes the cognitive ontology implicit in (much of) RECS - or so I shall claim.

The plant cognitive revolution: How plants engineered their own world

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The Cambrian Explosion has been linked to the "birth of the mind" in metazoa, fostering the evolution of nervous systems and more sophisticated sensorimotor systems. Yet, an underappreciated cognitive revolution happened during the Devonian Explosion – this time in plants. If the animal cognitive challenge was to further optimize perception-action to more flexibly coordinate in ever more dynamic and complex environments, plants faced their own unique cognitive challenge: the conquest of land itself. This conquest necessitated innovative strategies improving their space-filling and resource acquisition capacities. Even more importantly, the plant cognitive revolution centered around the engineering of their ecosystems to suit their needs by modulating, soil, wind, moisture, light, and even fire. Plants achieved this via strategies such as forming symbiotic alliances with fungi, complexifying their bodies through new forms of modularity, developing a tree habit that enabled them to conquer space in the vertical dimension, and developing seed dispersal methods to reach previously inaccessible patches of land. This culminated in forests, creating an ecosystem defined by plant bodies themselves. Unlike animals whose cognitive revolution helped them better coordinate in their environment, the plant cognitive revolution helped plants shape their environment.

Worldmaking as socially distributed cognition: the account of Mary Douglas

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Despite the advancement of radically embodied proposals, human cognitive processes are still mostly assumed to be realised by individuals only. An alternative account is provided by the anthropologist Mary Douglas. Douglas refers to Nelson Goodman's thesis that the world affords infinitely many – albeit not just any – versions of itself, proposing that the key mechanism of how one specific version is cultivated is the collective engagement with exemplars – that is, with tokens that, in virtue of displaying specific properties, simultaneously refer to and construe a general class to which they belong. Since birth, individuals must attune themselves to social worlds pregnant with pre-established notions of 1) which tokens, among many possible others, are relevant as exemplars; 2) which of their properties are most relevant; and 3) which meanings are to be derived therefrom. Douglas believed that, through exemplification, a group's classification system becomes a self-evident perceptual reality to the individuals composing it. Thereby, groups act as rightful cognitive agents, to the extent that they constrain the cognition of individuals embedded in them without being reducible to an aggregation of it. Douglas' externalist and socially distributed account productively relates to other radically embodied accounts of social constraints on cognition.

Wayfinding in the wild

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Edwin Hutchins' famous investigation of naval navigation is a significant landmark in the development of situated and distributed approaches to studying cognition. Yet, despite the wider impact of Hutchins' research in cognitive science, the field of wayfinding research has remained stubbornly dominated by narrower cognitivist approaches. Recently, however, this has started to change. There is increasing acceptance that embodied, social and environmental factors are an integral part of everyday wayfinding. In this talk, I outline how the Situated Cognition Research Group at Bournemouth University has begun to develop a research programme focussed on wayfinding in the wild. Through briefly explicating three research projects – a phenomenologically-informed experiment on searching in the real world, a cognitive ethnography of hospital wayfinding, and a qualitative investigation of navigation in an ultramarathon – I foreground how our initial research supports the conception of wayfinding as a dynamic, collective and socially-situated activity.

Gesture studies meets radical embodied cognitive science (and the problem of gestures without bodies)

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This paper offers a conceptualization of the contemporary field of gesture studies (Cienki, 2024; Müller, 2002), evaluating to what extent its different traditions can be considered 'embodied' when viewed from enactive and ecological perspectives (Baggs and Chemero, 2021; Di Paolo, Heras-Escribano, Chemero, & McGann, 2020). To do this, I focus on studies of a well-researched gesture associated with spoken language negation (Harrison, 2024), building a micro-corpus from diverse theoretical and methodological perspectives. I take these perspectives to represent some of the field's disciplinary influences, and furthermore, view their focus on gesture and speech as a fractal for the authors' conceptions of bodies and language. This latter move brings gesture studies into the territory of radical embodied cognitive science, where questions of what is meant by 'the body' and by 'language' are seen as foundational issues (Di Paolo, Cuffari, & De Jaegher, 2018; Gallagher, 2017; Steffensen, Döring, & Cowley, 2024; Thibault, 2021). It is from radical answers to these questions that I distil desiderata for approaches to gesture that aspire to be embodied. This leads me to discover accounts of gestures without bodies in my corpus, and more generally, contributes by showing how radical embodiment can function as a framework.

Culture, Language, and Cognition: An Anthropological Critique of Linguistic Relativity Research

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Philosophy of mind, neuroscience, (cognitive) psychology, socio-cultural anthropology, and radical embodiment fall under the rubric of "cognitive science" and share a similar project of explaining human cognition. Yet, the mainstream views of these disciplines fundamentally disagree about the need to postulate internal mental representations, symbols thought to encode information about the world, to explain behavior. Most philosophers, psychologists, and neuroscientists assume that mental representations are indispensable for explaining cognition (Favela & Machery, 2023), but most anthropologists and proponents of radical embodiment reject representationalism, arguing that it overintellectualizes the lived and situated experience of individuals. I argue that the disagreement over representations stems from the assumption of a universalism of cognition that fits well with the cognitivist approaches that dominate neuroscience and cognitive psychology but go against anthropology's fundamental assumption of cognitive and cultural diversity. I illustrate this with linguistic relativity research, arguing that it inherits the problems of cognitivism when conducted according to its psycholinguistic formulation (Lucy 2016). Finally, I propose an ethnographically informed perspective on the influence of culture and language on thought, to show that taking culture and language into account is explanatorily superior to dissociating language from culture, as is standard practice in most linguistic relativity research.

An Ecological Approach to Numerical Perception

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Embodied approaches to the mind are often accused of struggling to account for our capacity to think about supposedly abstract entities, such as numbers. However, evidence from the study of numerical cognition arguably suggests that humans and a broad range of other species have perceptual access to numerical properties despite the abstract or multimodal nature of these properties (and that these need not be understood as mere numerosities) (Clarke & Beck 2021). This perceptual access to number provides a potential embodied basis for numerical cognition. However, much of the work on numerical perception unwarrantedly assumes a representationalist approach, in conflict with Radical Embodied approaches (Jones, Zahidi, & Hutto 2021). I will present options for understanding numerical perception within the Ecological approach to perception, as perception of affordances (Jones 2018), thereby avoiding commitment to representationalism and providing the basis for a Radical Embodied approach to numerical cognition.

Holistic representative design

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Contemporary perspectives in applied psychological science have critically considered the importance of ensuring the appropriate generalisation of findings in experimental research. For example, the Constraints on Generality (CoG) proposal of Simons et al. (2017) has argued that the discussion section of all articles describing empirical research should include a statement that explicitly identifies and justifies the target populations for the reported findings. The CoG proposal is consistent with literature that has emphasised the importance of the appropriate sampling of participants in experiments. By contrast, comparatively less literature has critically considered methodological frameworks to inform the appropriate sampling of environmental settings in experiments. One notable exception is the representative design perspective of Egon Brunswik (1956), which emphasises the need to sample the causal texture of the environment to which the human has adapted and to which the researcher intends to generalise their findings.

The current work extends representative design by drawing up the work of Frederic Bartlett (1932; 1956), who was critical that early cognitive psychology methods reflected a "laboratory game". Most notably, Bartlett embraced holism in his attempts to make the experiment closer to everyday life conditions, whilst also drawing upon early qualitative and observational methods in his work. The resulting Holistic Representative Design is a multi-stage methodological framework that draws upon co-production with participants to develop an experiment to ensure the appropriate generalisation of findings to the environmental setting of interest.

Sensorimotor incorporation: an operational definition

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Sensorimotor incorporation is the most intimate form of environmental dependence, as it transforms external objects into part of ourselves, irreversibly changing our agency. Existing accounts oscillate between excessively strong conceptions, which limit incorporation to body-part-like objects, and weaker views, which equate it with mere skillful tool use. Building on enactive ideas, we propose an operational definition of incorporation that avoids these extremes by emphasizing two key features: portability, the capacity to use the incorporated object across contexts, and irreversibility, the transformation of agency such that the object becomes central to the agent's viability. An object is central when its loss would render the agent unviable or require significant adaptive effort to restore viability. We further argue that only concrete objects—those whose potentialities are actualized through interaction—can be incorporated. Incorporation, thus, forms an integrated agential system that is portable, versatile, and operationally dependent on the incorporated object. While the incorporated object becomes central for a given agent's form of life, it can still be replaced by another particular object, provided it can be equivalently concretized. This account clarifies the nature and apparent paradoxes of incorporation and its role in shaping sensorimotor agency.

Presence and co-presence in aesthetic experiences of live performance

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This paper brings together two areas of scholarship interested in aesthetic experiences of live performance, performance studies and 4E4A (embodied, embedded, extended, enactive + affect, affordance, agency, autonomy) cognition, to propose a framework for understanding the experiences of presence that manifest in the aesthetic experience of audience members and performers. We argue that presence may be integrated into the enhanced meshed architecture model (Gallagher and Varga 2020) to explain the general structure of presence experiences. Through the enhanced mesh framework, different experiences of presence can be explained by attending to the degree of integration of one's reflective and pre-reflective self-awareness, the extension of one's awareness towards the environment, and the way in which self-and-other-awareness are intermeshed, which is modulated by the 4As. A significant upshot of the framework is that it can explain the particular variability of audience experiences of presence, and how different presence experiences affect the audience's participation and overall aesthetic experience. This paper offers an original contribution to the performance studies literature on presence and the 4E4A literature on aesthetic experience of live performance. The paper this talk is based on is co-authored by Sophie Morrissey and Shaun Gallagher. Sophie Morrissey is the lead author and will be presenting the talk.

Embodied generalised episodic remembering

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In this talk, I propose bridging the gap between episodic memory (EM) and embodiment through generalised episodic memories (GEM) – memories that, while exhibiting the main features of EM, do not refer to a particular past event, but rather to the repetition of an action over time within a similar context. A paradigmatic case of GEM is remembering the way to high school as a teenager. Importantly, this same repetition is what underlies the creation of habits, skills and other forms of embodied memories. In fact, walking to high school eventually became a habit, leaving behind a sedimented knowledge of how to get from your old house to the school. Therefore, the repetition that leads to the formation of procedural memory can also give rise to GEM. The idea I want to endorse is that GEM are the simulated counterparts of procedural and embodied memories. As some people have proposed, the ability to create a simulation instead of bodily re-enacting the past accounts for the communicative function of EM. Thus, GEM can be seen as a way to communicative to others the embodied knowledge that permeates habits or skills.

An ecological approach to psychedelic perception

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Psychedelic drugs present us with a challenge to overcome. This is because these drugs place the subject in an unusually strange perceptual state, in which we interact with the world differently than we usually do. Therefore, to explain their effect we usually do not employ the default explanation that assumes veridical perception. Currently, illusions or perceptual alterations and executive changes produced by psychedelics are explained mostly by internal factors, while environmental ones are relegated to the mere contribution of the context (Letheby, Carhart-Harris). In contrast to this theoretical framework, ecological psychology provides the resources to explain these alterations by focusing on the organism-environment relationship and not so much on the organism or brain themselves. Focusing on visual perception, psychedelic experiences can be characterized as follows: on the one hand, hypersensitivity to environmental gradients, tracking of alternative patterns and non-judgmental attention; on the other hand, changes in the field of affordances, miseducation of our intentions and divergent or out-of-the-box decisions. In addition, in order to explain all this, I consider it appropriate to complete the theory of attention that ecological psychology handles through the theory of A. Gurwitsch (theme, thematic field and margin).

Against fictionalization of virtual actions

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This talk offers a new theoretical option inspired by Embodied Cognition framework that bypasses the fictionalist vs. realist dichotomy in the VR literature. Fictionalists make a forced separation of the 'game-world' from the 'real-world', which has strange practical and ethical consequences: all virtual interactions would have to be seen as fictions. Realists assume the reality of an agent pushing a button which causes the "digital actions" of the avatar in another realm. This assumes dualism about action, and undermines that one can learn new skills from virtual engagements that sensitise us and allow to form new habits. Our framework proposes that there is only one agent and one action to be considered in VR - the action of the player who is engaging with a complex technological interface - and not two (one real and one digital or imagined/illusory). It builds on the enactivist view of agency, which claims agents define their own individuality, are active source of activity in their environments, and regulate this activity in relation to certain norms - all of which is achievable in VR. Our view has important pragmatic consequences on questions of ethics and therapy, thinking of abuse, rape or violence in virtual worlds.

Affordances in the Wild

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Gibsonian ecological psychology's historical development as an experimental laboratory science has entailed the neglect of naturalistic observation. The result has been a disproportionate focus on the study of affordances for body-scaled action in real-time interaction with surfaces and objects in the lab—illustrating the assumption that sociocultural conditions are merely the 'context' for affordances, a context that can be neutralized in the lab. Against this assumption, and in line with calls for "rewilding" psychology (Baggs & Sanches de Oliveira 2024, Sanches de Oliveira & Baggs 2023), we argue for the benefit of considering affordances "in the wild," in real-world activity outside the lab. We draw from anthropological descriptions of a case of technology adoption and grassroots innovation in rural Uganda in the early 2000s, and we use this case to highlight the constitutive (rather than merely contextual) role of sociocultural 'factors' in the perception and realization of affordances. Although the particulars of the case are unfamiliar and likely strange for contemporary WEIRD audiences, we argue that the case is not unusual. Building upon previous work on the relation between affordances, behavior settings and cognitive institutions, we offer an account of affordances and affordance perception as always socioculturally co-constituted, spatiotemporally extended and institutionally entangled.

An organizational approach to affordances: meaning between information and dynamics

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In ecological psychology, affordances are patterns of information that enable goal-directed behavior. Yet, within an affordance landscape, why does an organism select certain affordances over others? How does the meaningfulness of ecological information emerge? This talk addresses these questions by proposing a novel view of affordances as self-organized informational patterns arising from the organism's informational reorganization. First, building on Chemero's situational semantics, we argue that while the Turvey-Shaw-Mace framework specifies the relationship among the environment, the energetic array, and the perceiver, it fails to explain why such information is meaningful. Second, we propose that this limitation is resolved by interpreting ecological laws as sets of non-holonomic constraints, drawing on Pattee's biosemiotic interpretation and the thermodynamics of dissipative systems. In our view, organisms are fundamentally informational and energetic systems characterized by spontaneous, ontogenetically organized movement enabled by non-holonomic constraints that "freeze" internal informational order parameters. We conclude that the specificity of affordances results from the organizational dynamics of the organism-environment system. Affordances possess meaning because they are functionally significant for the organism, which becomes synergistically organized into softly assembled, context-dependent structures.

A world of minds: ecological psychology as a framework for comparative cognition

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In this talk, I will present ecological psychology as a powerful alternative to dominant computational and neurocentric models in comparative cognitive science. While traditional approaches view cognition as brain-based information processing, ecological psychology reframes it as an active process of detecting and exploiting information directly from the environment. By examining empirical studies across a wide range of species, including mammals, insects, and even plants, I will argue that ecological psychology offers a promising framework to make sense of how diverse life forms engage with their environments in functionally intelligent ways, fostering a richer and more accurate comparative cognitive science. Finally, I will offer an argument that ecological psychology can help us mitigate the effect of anthropocentrism in comparative cognitive science.

Exploring human interaction with AI and LLMs in healthcare from a distributed perspective

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The digital health communication landscape is undergoing rapid transformations due to developments in Artificial Intelligence (AI) and Large Language Models (LLMs). For example, AI chatbots are claimed to pave the way for relieving healthcare professionals from replying to patients' written inquiries in e-consultations. Some argue that the new technology may handle digital communication better and more empathetically than humans. Such claims are often made without providing critical reflections or definitions of the kind of language view the technologies and researchers themselves are promoting, which is tied to an instrumental and computational approach. However, a computational approach to language and human interaction risks overlooking social dynamics and installing a reductionist understanding of interaction, as it promotes a disembodied view of human behavior. Therefore, the goal of this presentation is to discuss the value of the distributed perspective when considering usefulness and impact of AI/LLMs in healthcare contexts. Drawing on data from fieldwork from Danish healthcare settings, we point to the situated, embodied, ecological, and distributed aspects of language and human interaction to explore the complexity that conditions embodied interactions with AI and LLMs.

Perceptual justification and place: Merleau-Ponty & Seigel on place-making & memory

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Space has no meaning other than being un-experienced if we have no movement, habit, or lived experience within it. Therefore, place-making is a process of embodied perception that transforms 'incomplete space' (being un-experienced) to 'place' holding memory. I argue that place-making does not occur without a combined process of sensorimotor engagement and perceptual justification; perception, movement, and lived experience construct memory, thereby creating spatial significance. Framed with Merleau-Ponty's phenomenology of space and Siegel's theory of perceptual content, I propose our embodied interactions transform space by integrating justificatory processes that extend beyond mere representation. While representational traps exist if holding too much to Siegel's view, a necessary balance of perceptual justification is needed to justify how spatial memory and meaning are construed, as how we see a space, shapes what the space becomes. This approach challenges strict, non-representationalist models of radical embodiment, whilst holding to the deeply enactive, lived nature of spatial experience

Posters and flash talks

MIND Script: situated cognitive blueprints for seamless social interactions

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Social cognition is often framed in terms of mindreading, yet this assumes cognitively demanding mechanisms that may not be necessary for routine interactions. The MIND Script framework offers an alternative by emphasizing scripts as low-level, distributed structures that guide behavior without requiring constant mental state inference. Rather than residing solely in the mind, scripts are embodied and embedded in shared environments, cultural practices, and technological scaffolds, enabling seamless social coordination. Drawing from distributed cognition, situated affectivity, and ecological psychology, MIND Script highlights four key dimensions: Modularity, allowing scripts to adapt flexibly across contexts, Interdependence, ensuring coordination through shared expectations, Negotiability, allowing for modification and contestation, Distributedness, extending scripts beyond individual cognition into social, material, and technological landscapes. Additionally, affect plays a central role in sustaining and recalibrating scripts, reinforcing their persistence while allowing adaptation when emotional or normative expectations shift. This talk explores how MIND Script aligns with embodied and distributed cognition, positioning scripts as externalized, dynamically structured resources rather than purely internal schemas. This shift opens new avenues for understanding social interaction beyond inferential models of cognition.

Enactive narratives and material engagement

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In this talk I present an enactive theory of narratives. Contrary to the representationalist accounts of narratives (Stock, 2017; Thomasson, 1998, 2003), that are dominant in the analytic philosophy, I will defend that narratives are not purely intentional experiences; they rather are enactive experiences. I will argue that narratives exist in the material engagement (Koukouti & Malafouris, 2020; Malafouris, 2013, 2019, 2020) of an agent with a set of material representations she can rely on in her ecological niche. I will draw on the concept of imaginal space (Consiglio, 2021) to define the specific cultural niche, rich of images, of which many humans have experience. I think that the use of such images may enable a form of "enactive signification" (Malafouris, 2007) crucial for narrative practices. Specifically, I defend that we materially engage with public images to model our narratives, the characters and stories that we imagine and tell. Narrative imagination is then immanent in the very action of manipulating material representations in an ecological niche. In my account narratives emerge in the enactive dynamic of some agents moving in their imaginal space, rather than being mere intentional objects in a cognitivist framework.

How radically embodied can intentions in skilled action get?

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While 4E approaches to cognition are increasingly popular, mainstream accounts of skilled actions remain committed to an internalist, representationalist reading of intentions (Fridland 2020, Mylopoulos 2020, Wu 2020). According to this reading, intentions are first-person, subject level states that represent the action, its goal, and how to achieve it. In contrast, my talk will discuss the possibility of a fully radically embodied reading of intentions drawing on Dreyfus's (2002, 2005) account of intentions as based on embodied abilities and affordances instead of higher-order, offline cognitive capacities. I will then consider two points to assess the viability of this reading of intentions for any radically embodied account (Hutto & Robertson 2020; Gallagher 2022; Robertson & Hutto 2023). First, while a radically embodied account can handle intentions related to immediate, proximal situations and tasks, it struggles with intentions that extend into the future. Second, although metacognitive capacities can account for intentions that extend into the future, these approaches don't have the resources to address such cases since they argue for reconceptualization of those capacities as purely embodied and action-oriented without accounting for how such reconceptualization makes the difference in addressing the temporal extension of intentions for actions.

Perceiving relevance: two views on agency and affordances perception

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It is widely accepted within Ecological Psychology that perception is intentional. Intentionality helps to explain the transition from action possibilities—i.e., affordances perceived by the animal—to relevant actions, which the animal typically performs. In this talk, I will present two contrasting approaches to agency: the Selection View and the Coordination View. Each perspective offers a different understanding of what constitutes a relevant action and how it relates to the definition of affordances as possibilities for action. The Selection View suggests that relevant actions result from a selection process guided by an intentional background. While this is the most common approach, I will critique its conceptual limitations. Specifically, I will argue that it makes difficult to unify the realm of objects of perception—which is inherently non-normative and non-intentional—with the process of taking advantage of those objects, where agency appears to be situated. By contrast, the Coordination View posits that relevance is primary and cannot be understood as the outcome of a subsequent selection among possibilities. Instead, relevant behaviors emerge through the process of maintaining coordination with the environment. This notion of coordination requires us to accept that are relevant actions, rather than mere possibilities, what we directly perceive.

Coordinative structures in agent-environment systems

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This talk introduces the concept of coordinative structures (Kelso, 2014) and discusses how its application can help researchers identify complex, causally efficacious structures, within organism-environment systems realized by interactions between behaving agents and elements of their perceptual environments (Raja, 2018; Raja & Anderson, 2019). Furthermore, I argue that certain mental states (such as distal intentions and moral beliefs) can be identified with such coordinative structures, and provide an outlook of how dynamical systems methodology may aid in individuating mental states conceptualized this way.

An atmosphere of affordances: an argument for the enactive-ecological account of ASD

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Atmospheres can be defined as emergent features of an environment. However, people with autism spectrum disorder (ASD) experience major difficulty in perceiving these features. In this talk, I will argue that this difficulty can be more effectively explained through an affordance-based enactive-ecological account rather than by referring to a Theory of Mind (ToM) impairment. Atmospheres' perception is thought to be influenced by an individual's ability to grasp people's mental states. In other words, it may partially depend on a functioning ToM, thus explaining the difficulties associated with ASD. However, by focusing solely on the interpersonal component, this hypothesis overlooks the object-related component in the emergence of an atmosphere. Moreover, atmospheres elicit certain behaviors. Several authors have interpreted this phenomenon through the concept of affordance—that is what the environment offers an agent in terms of possible actions. This suggests that the perception of atmospheres involves both the ability to grasp the environment through direct experience and the capacity to interpret it in terms of actions to be taken. Explaining the difficulty ASD individuals face in perceiving an atmosphere through the lens of these affordance-based enactive-ecological account will provide a more comprehensive framework, integrating both interpersonal and object-related components.

Unravelling binaries: perception/action and ur-intentionality

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Those who seek to radicalise enactive cognition attempt to reconceptualise the philosophy that underpins an embodied cognitive science. The perception/action of basic living organisms exhibits directedness by dynamically coupling with some features of the environment rather than others. This Ur-intentionality is a modest version of the intentionality that is characterised by aboutness, has semantic content, and emerges through linguistic practices. Yet, pertinent questions remain about the emergence of Ur-intentionality. My poster will suggest that the dynamic coupling between minimal life and the environment should be understood as an intra-active rather than interactive relation. This entails that the organism and features of the environment are both performative and transformative and recognises the co-constitutive ways that perception/action emerge from this reciprocal relation. Adopting this view involves a blurring of the boundaries between epistemology and ontology and acknowledges the ways in which these disciplines are co-implicated. I suggest that this approach avoids the anthropocentric binarism that is evident in much cognitive science and raises significant questions about the nature of observation. Ultimately, I wish to invite considerations and questions about what philosophical issues are raised within an onto-epistemological enactive science and the potential implications for radicalising enactive cognition.

An enactivist model of how participatory sense-making is modulated by objects in autism

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The divide between co-occurring social and asocial affordances during social interac- tions is thin and fluctuating because bodily resonance, intercorporeality, and objects are dynamically entangled in processes immanent to participatory sense-making, i.e., par- ticipatory sense-making is embodied and, therefore, not separable from its mileu. In other words, the enactivist radically embodied conceptualisation of social interaction inherently involves, in one way or another, the bidirectional impact between agents and environment. By zooming in on this impact, my talk will sketch a radically embodied model that describes participatory sense-making as emerging from the ongoing dynamic scaffolding and coupling between agents and objects. The starting point for sketching it is the model developed by Ezequiel A. Di Paolo, Elena Clare Cuffari, and Hanne De Jaegher in Linguistic Bodies due to their intricate analysis of the mutual influence of environment, subjectivity, and intersubjectivity. After articulating my model, I will nuance it by applying it to Sofie Boldsen's descriptions of how material objects scaffold the social interactions of people living with autism. By doing so, my talk will provide a radically embodied model that furthers the comprehension of participatory sense-making in autism.

Radically embodied introspection, radically extended metacognition

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A recent paper by Facchin et al proposed the thesis of 'Radically Embodied Introspection' (REI). According to this view, when I introspect I simulate a conversation with a therapist, or simulate journaling: I internalise extended practices and process them in an embodied way. A key challenge to this view is the idea that the internalisation of these practices requires the sorts of complex cognitive machinery that REI was supposed to avoid. How to meet this challenge? A standard view of metacognition (i.e. Proust 2013) maintains that we internalise introspective practices using complex metarepresentational machinery specialised for the self-attribution of mental states. Here, against the standard view, I propose the concept of 'Radically Extended Metacognition' (REM) in support of REI. According to REM, we internalise introspective practices using learning processes that are themselves embodied and acquired from the environment (i.e. Heyes et al 2020). My ability to judge which practices to internalise, and what constitutes the best method of internalisation, is on this view extended: I assess my own cognitions using assessment practices derived from the sociocultural world. I argue that REM enables REI to meet the explanatory challenge raised above, revealing the complementary nature of the approaches.

Enactive resilience: a systemic ethics approach to climate governance

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By 2024, global temperatures surpassed the 1.5°C threshold set by the Paris Agreement, with January 2025 reaching 1.80°C above pre-industrial levels in Europe (Copernicus Climate Change Service, C3S). Despite pledges to reduce emissions by 45% by 2030 and reach net-zero by 2050, nations are withdrawing commitments rather than strengthening them. Economic crises, regional wars, and rising authoritarianism dominate political agendas, diverting attention from climate action. Meanwhile, climate activism faces repression, losing institutional support and funding. The crossing of 1.5°C intensifies social tensions and ecological instability, yet global governance fails to prioritize climate mitigation or crisis management, fostering pessimism about the future. Climate change is a collective action problem marked by distributed responsibilities, asymmetrical vulnerabilities, and intergenerational dilemmas. Traditional justice theories and economic models struggle to integrate ecological complexity and uncertainty, often reducing climate action to cost-benefit analyses or short-term mitigation efforts. Existing climate governance remains reactive rather than proactive, focusing on mitigation rather than building resilience to inevitable climate impacts. Therefore, I believe that scientists and intellectuals must urgently begin working not only on mitigating the causes of climate change but also on preparing for the potential societal collapse it may trigger. This study argues that a resilience-based climate ethics and governance model is needed globally, which integrates uncertainty, nonlinear ecological dynamics, and institutional feedback into decision-making, fostering adaptation strategies that enhance both institutional and ecological resilience. To achieve this, I propose applying the conceptual framework of enactive systemic normativity to climate ethics, allowing us to develop governance strategies that frame climate justice not as a fixed distribution of burdens and benefits but as a dynamic process of building collective resilience. Enactive systemic normativity provides an alternative: an ethics of self-organization, where norms evolve through interaction rather than rigid principles. The enactive perspective can help redesign climate governance as an open, participatory process rather than a self-contained institutional framework. A systemic understanding of value emergence can improve public engagement strategies, and institutions can implement feedback-sensitive governance models to integrate evolving public climate values. As a case study, I will present findings from my previous ethnographic research on the pandemic response of frontline healthcare professionals in Istanbul during the initial phase of COVID-19, illustrating how resilience-based preparation for systemic crises is crucial and how linear decision-making mechanisms and the absence of feedback-sensitive governance lead to moral and organisational crises. This study advocates for a new ethical-political framework that move beyond cost-benefit analyses in climate policy, incorporating adaptive management strategies that emphasize resilience alongside risk minimization.