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(on behalf of the CONTACT consortium)



## Consciousness in Interaction

The Role of the Natural and Social Environment in Shaping Consciousness

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- **Project Leader**  
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- **Principal Investigators**  
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*Enrico Rambaldi, Istituto per la Storia del Pensiero Filosofico e Scientifico Moderno - CNR, Milano (IT)*
- **Associate Partner**  
*Thomas Metzinger, Johannes Gutenberg Universität Mainz (DE)*

*Phenomenal consciousness and self-consciousness have their origins in **dynamic interactions** of a cognitive agent and the **natural and social world** in which this agent is embedded.*

Our project will investigate the hypothesis that **interactions** enable **various modes of conscious experience** and determine what such experiences are like.



This perspective **contrasts with the internalist view** that brain activity by itself enables conscious experience and determines what it is like.

Internalism has led scientists to **neglect the contributions that interactions with natural and social environments** make to enabling the diverse modes of conscious experience and to fixing their **qualitative** character.

Internalism has failed to bridge the **'explanatory gap'**

1. the qualities of experience – **what** an experience is like.

Interactionist explanations offer an account of the **qualities** of experience in terms of an agent's sensorimotor interactions with her local environment and the practical knowledge the agent draws on in these interactions.

“what-interactionism”

? Debate: does conscious perception play a role in dynamic sensorimotor interactions, like fine-tuned control of action, or only in the reason and memory-based selection of the appropriate action ??  
(two-visual systems hypothesis, Milner-Goodale)

2. The **interactions** of an agent with her environment generate a tangle of causal and informational flows centred on the agent herself but **extending beyond the agent** to include other agents and features of her environment  
the mechanisms and processes which enable **consciousness** and **self-consciousness**:

“**how-interactionism**”

?? **Extended Cognition vs./and Consciousness**

- “Active Consciousness”
- “Interactive Consciousness”
- Cultural & Historical Dimensions  
Of Consciousness and Self-Consciousness

*Phenomenal consciousness* is called 'active consciousness' (although it can include **simulations** of sensorimotor interactions used **both on-line** and **off-line**) because conscious perception is a **skilled activity** in which the agent has implicit knowledge of the sensory consequences of movement.

- phenomenally conscious perception isn't something happening **only in the brain** but is rather a temporally-extended activity of **exploring** one's environment
- We need a better understanding of the functional and diachronic relations between **active consciousness**, **interactive consciousness** and **social cognition**



- The role of **social cognition** in interactive consciousness and self-consciousness,
- the *modes* of **emotional consciousness** and their relationship to self-consciousness

- The origins of our concept of “consciousness” (and related ideas)
- Complex emotional phenomena; “empathy” and “detachment” and cultural differences.

- [IP-01] *The Social Dimension of Consciousness* (Castelfranchi)
- [IP-02] *Making Up Minds: Sensorimotor Dynamics, Social Cognition, and Consciousness* (Hurley)
- [IP-03] *Active Consciousness, Embodiment, and the Sense of Self* (Clark)
- [IP-04] *Emotional Feelings and Subject-Object Relationships* (Tan)
- [IP-05] *The Conceptual Roots of Consciousness in Interaction: Mapping the Notion of Consciousness in the European Culture* (Rambaldi)
- [AP-01] *Functional, Intentional, and Phenomenal Layers in the Human Self-Model* (Metzinger)

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- Team members: Dr. F. Paglieri, Dr. A. Rissotto, Dr. M. Miceli, Dr. M. Mirolli, Dr. L. Tummolini
- External collaborators: Prof. R. Manzotti (Milano), Dr. G. Consoli (Siena)



- Self-consciousness as meta-cognition co-develops with socio-cognitive capacities, and in particular with mindreading
- Primacy of the latter (social mindreading enables self-consciousness), but interaction is bilateral: primitive forms of mindreading enable self-consciousness, which in turn impinges on the development of further mindreading capacities
- Emergence and awareness of full-blown mental states (beliefs, goals, intentions, desires) is modulated by social interaction, and can be explained without assuming immediate introspection of such states

- What are the **different functions of mindreading**, how do they relate to each other, and how do they evolve in species and develop in individuals?
- What is the connection between **self-consciousness, volition, and willpower**?
- How can we **explain awareness of mental states and of their causal power**, without admitting direct introspection of them?
- What are the **stages** through which self-consciousness might emerge from more basic capacities for social cognition?
- What is the import of these views for (1) **existing theories of consciousness**, and (2) the debate on **internalist vs. externalist** nature of the mind?

- University of Bristol, Dept of Philosophy (UK)
- Principal Investigator: *Prof. Susan Hurley*
- Internal collaborators: Prof. A. Bird, Prof. I. Gilchrist, Dr. F. Spicer, Dr. J. Ladyman, Dr. H. Leitgeb, Dr. S. Okasha, Dr. A. Everett
- External collaborator: Prof. A. Noë (Berkeley, US)

- Instrumental actions and sensorimotor dynamics (SMD) are integrally related to consciousness in certain cases (e.g. where a given phenomenal quality has variable neural correlates) and contribute especially to addressing comparative explanatory gaps
- Social-cognitive interactions that build on SMD can further contribute to explaining consciousness and self-consciousness
- SMD explanations of consciousness are to be developed by addressing salient challenges (e.g. synaesthesia, dual vision views) and by relating it to further phenomena (e.g. incentive learning, blindsight and other implicit/explicit dissociations)



- Are SMD and other 'active' approaches to understanding conscious perception **inconsistent or complementary with dual vision views**?
- How are **instrumental learning and action** related to consciousness?
- How can SMD address comparative explanatory gaps where a given **phenomenal quality has variable neural correlates**?
- How is **explanatory externalism**, as in SMD accounts, related to traditional philosophical discussions of externalism in terms of **local supervenience**?
- How can **expressive actions and emotional experience** build on SMD resources for instrumental action? Do emotions provide a basis for understanding the role of social-cognitive interactions in consciousness?
- Can SMD views address the **absolute explanatory gap**, or is another approach needed?
- What are the relations between **simulation mechanisms** in social cognition, in motor control, and in consciousness?

- University of Edinburgh, Dept of Philosophy (UK)
- Principal Investigator: *Prof. Andy Clark*
- Team members: Dr. T. Vierkant, Dr. M. Nudds, Dr. J. Kallestrup, Dr. J. Kiverstein
- External collaborators: Prof. A. Noë (Berkeley, US), Dr. M. Wheeler (Stirling, Scotland), Prof. M. Rowlands (Hertfordshire, UK), Prof. P. Calvo Garzon (Murcia, ES)

- The role of **agent-environment interaction** in explaining basic conscious experience is **more restricted** than is predicted by Dynamic Sensorimotor (DSM -see IP-02) accounts, and **the role of consciousness in determining intentional behavior** requires some careful re-thinking
- Thus **DSM accounts of consciousness and self-consciousness** need **probing and critical examining**, looking for an alternative positive account that respects both the **active nature of perception** and the distinctiveness of the **different layers of agent environment interaction**

- Comparing **two visual systems hypothesis** and **DSM accounts** of consciousness
  - The **functional role of conscious experience** – might its function be limited to making available information for the **selection of gross action-types and targets**?
  - Could the **mechanisms** used by our sensorimotor systems in the execution and understanding of goal-directed action **also support higher-cognitive abilities**? In what way?
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- How much of our behaviour is **automatic** and so not subject to conscious control? How should this impact our ideas about the **nature of agency**?
  - What kind of consciousness is involved in **willed action**?
  - What is the connection between **theory of mind capacities, the narrative self and conscious control**?



- Universiteit van Amsterdam, Department of Communication (NL)
- Principal Investigator: *Prof. Ed S. H. Tan*
- Team member: *Prof. N. Frijda*

- Emotion experiences reflect **embodied subject-object interactions**, the nature of which varies with the **engagement** in the interaction
- All emotion experience involves subject-object interaction in **embodied appraisal** and **action readiness**
- **Detached** emotion experience involves **observational stance** and **virtual (imaged) action readiness**
- **Virtual (imagined) action readiness** still can constitute **(detached) emotion experience**

- Tracing the content of emotion experience as a function of **engagement / detachment**
- Examining **cultural influences** on this function
- Extension of study of everyday emotion experience by **self reports**
- Extension of analysis of **(detached) emotion refinement in poetics and aesthetics**
- Literature study of **rasa** (Indian category of **drama-induced emotion experience**), and **observational study** of rasa in Indian theater practice
- Exploring the possibility of **fMRI studies of mirror neuron activity** of action readiness **during emotion experience**

- Istituto per la Storia del Pensiero Filosofico e Scientifico Moderno - CNR, Milano (IT)
- Principal Investigator: *Prof. Enrico I. Rambaldi*
- Team members: Prof. T. Gregory (ILIESI-CNR, Roma), Dr. G. Cerchiai
- Internal collaborators: Prof. E. Franzini (Milano), Prof. R. Pettoello (Milano), Dr. A. Pinotti (Milano), Dr. P. Valore (Milano)



- Proper understanding of the categories of consciousness, awareness, self-awareness, emotions, etc., requires examination of their **cultural and historical genesis**, particularly re: the **internalism / externalism** distinction in the modern and contemporary age
- This implies careful **documentation** of the sources, **study and interpretation** of the texts, **critical analysis** of the ideas and the authors, also in a **historical perspective**

- **Internalism vs externalism** in the modern age: the examples of Giambattista Vico, Antonio Vallisneri and Girolamo Cardano
- Origins of the term “**Consciousness**” from **Renaissance to Enlightenment** (analysis of classical texts, dictionaries, encyclopedias and translations)
- **Active consciousness** and **interactive consciousness** in contemporary philosophy
- **Consciousness, history of philosophy and art**: emotion, memory, identity and knowledge

- Johannes Gutenberg Universität Mainz, Dept of Philosophy (DE)
- Principal Investigator: *Prof. Thomas Metzinger*

- To act as an external critic, challenging the internal project members in a constructive manner
- The aim:  
to further enrich the self-model theory of subjectivity (SMT)




- A criticism of the notion of “embodiment” and the distinction of different levels and kinds of embodiment.
- The relationship between (self)consciousness and (self)cognition: There exists an overlap between consciousness and cognition, but it is not clear if there has been a co-evolution or simply an addition.
- To offer a model about how a first-person perspective and the conscious experience of agency emerges

- A wealth of potential convergences and topics of debate. Just to mention a few:
  - Co-evolution and co-development of metacognitive capacities in social interaction and self-consciousness (with *METACOGNITION* CRP)
  - Refinement of externalist approaches to cognition and of the relationships between perception and action (with *Boundaries of Mind* CRP)
  - Critical analysis of the role played by sensory-motor dynamics in enabling conscious experience and sense of agency (with *BASIC* and *CEWR* CRPs)
- We look forward to all these potential interactions, and hopefully to many more, still unforeseen to us!

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For further information:  
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Thanks for your kind attention.



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