UNIVERSIDAD DE COSTA RICA
SISTEMA DE ESTUDIOS DE POSGRADO

Pre-reflective self-consciousness: A phenomenological account of its embodied, intersubjective and finite constitution

Tesis sometida a la consideración de la Comisión del Programa de Posgrado en Ciencias Cognoscitivas para optar al grado y título de Maestría Académica en Ciencias Cognoscitivas

LUCÍA BRICEÑO QUINTANA

Ciudad Universitaria Rodrigo Facio, Costa Rica

2025

DEDICATORIA

Al mundo, esta tierra y toda su vida en medio del ecocidio. A los pueblos palestinos, congoleses, sudaneses, haitianos, y a todos los pueblos y "comunidades afectadas", por no poder hacer más para detener los genocidios que acaban con sus vidas, en esta larga crisis capitalista que arrasa con la conciencia, con el mundo como lo conocíamos, que mata mientras muere.

A Neveen Qadeih, que sobrevive en Khan Yunis, Gaza. A sus hijxs, Taghreed, Madhat, y Solomón. Su resistencia, y amor por la vida han sido el empujón de resiliencia para continuar con este proyecto.

AGRADECIMIENTO

Muchísimas gracias a:

Mi mamita Noviela, mi abuela, por la claridad de sus enseñanzas y el amor por aprender.

Sarita y a Valentina, por ser motores de mi vida.

Priscilla A., por introducir la filosofía en mi vida con un libro acerca de Spinoza. A Marina Garcés por "Un mundo común" y a Jean Luc Nancy por "La comunidad inoperante".

Umi, Kaden, Emma y a mi pequeña Aileen, por venir para orientarnos.

Mi mamá, Marta, mi mar y mi brisa, mi casa que me enseñó a ver el mundo grande, que me enseñó a cuestionar y que, yendo en contra de la corriente de su época, cultivó mi infancia con posibilidades que al día de hoy siguen abriendo nuevas puertas. Gracias por darme un sostén nutritivo, tan firme, como flexible; sobre todo, gracias por inculcarme desde niñx acerca del cuidado, respeto y compromiso cotidiano con el entorno que habitamos.

Mi papá, Victor, mi árbol que da sombra en verano y protege de la lluvia en invierno. Gracias por todas esas tardes de tomar café mientras me enseñabas nuevas perspectivas del mundo. Por haberme apoyado desde el inicio y hasta el final en este difícil proyecto. Gracias por tus enseñanzas.

Mi hermana, Carito, por el cariño y la admiración que su vida inspira en mí.

Mi familia que no es de sangre y amigxs: su calidez, escucha, paciencia y confianza en mí han sido claves en este y los demás asuntos de mi vida que he tenido el gusto de vivir con ustedes…
Paula, Anggy, Ger, Danny, Majo, Sha, Randall, Manu, Pauli, Moni, Fer, Javi, Sil, Nico, Arantxa, AdRod.

Mis tías, mis referentes y pilares de vida, mis continuas fuentes de inspiración. Con mi mamá, los amores de mi mamita Noviela. Gracias por su apoyo.

Nestor Peirano, Luz Elena Garcia y Andrés Martinez, por el honor de su amistad, sus huellas y sus enseñanzas en mi vida, aunque fuera durante tan corto tiempo.

Un agradecimiento especial al profesor Lorenzo Boccafogli por su vital participación en momentos críticos de esta investigación, en torno a la amplia discusión del tema de la conciencia en la filosofía de la mente. Al profesor Diego Conejo, por su aporte en los estudios de psicología de desarrollo, así como por su guía y confianza a través de los años. Gracias también al profesor Juan Carlos Brenes por apoyarme en el abordaje de estudios de neurobiología, un tema tan fascinante como complejo. Asimismo agradezco el gran apoyo por parte del profesor Mauricio Molina Delgado en los primeros años de esta investigación; a Rolando Pérez, director del posgrado por la guía y el apoyo brindado.
Gracias a todas las personas que, de una u otra forma, me apoyaron en la culminación de este trabajo.

Esta tesis fue aceptada por la Comisión del Programa de Estudios de Posgrado en Ciencias Cognoscitivas de la Universidad de Costa Rica, como requisito parcial para optar al grado y título de Maestría Académica en Ciencias Cognoscitivas

Dr. Mario Solís Umaña
Representante de la Decana del Sistema de Estudios de Posgrado

Dr. Lorenzo Boccafogli
Director de Tesis

Dr. Juan Carlos Brenes Sáenz
Asesor

Dr. Diego Conejo Bolaños
Asesor

Dr. Jorge Morales Delgado
Representante del Director del
Programa de Posgrado en Ciencias Cognoscitivas

Bach. Lucía Briceño Quintana
Candidata

TABLA DE CONTENIDO

RESUMEN EN ESPAÑOL

Este estudio propone un marco conceptual tripartito basado en la pasividad, la afectividad existencial y la temporalidad, para examinar cómo se estructura la autoconciencia pre-reflexiva, explorando su constitución previa al pensamiento explícito. Con un enfoque fenomenológico se examina cómo la capa más básica de la autoconciencia es una experiencia vivida corporizada y afectiva, temporalmente estructurada e intersubjetivamente constituida.

Al articular los aportes fenomenológicos con hallazgos de las ciencias cognitivas, incluyendo la filosofía de la mente, la neurobiología y la psicología del desarrollo, esta investigación contribuye a los estudios sobre la autoconciencia. Este enfoque ofrece un marco conceptual para que a través de la interdisciplinariedad de las ciencias cognitivas se sigan explorando las experiencias conscientes más allá de la cognición explícita y la introspección.

ABSTRACT

This study proposes a three-fold conceptual framework based on passivity, existential affectivity, and temporality to examine how pre-reflective self-consciousness is structured, exploring its structure prior to explicit thought. Drawing on phenomenological philosophy of consciousness, it examines how the most basic layer of self-consciousness is an embodied and affective, temporally structured, and intersubjectively constituted lived experience.

By bridging phenomenological insights with findings from cognitive science, including philosophy of mind, neurobiology and developmental psychology, this research contributes to the understanding of self-consciousness. This approach provides a conceptual framework for cognitive science, within its interdisciplinarity, to continue the exploration of the lived experience beyond explicit cognition and introspection.

ABBREVIATIONS

- Central Nervous System (CNS)
- Peripheral Nervous System (PNS)
- Default Mode Network (DMN)
- Cortical Midline Structures (CMS)
- Prefrontal Cortex (PFC).
- Posterior Parietal Cortex (PPC),
- Anterior Cingulate Cortex (ACC)
- Temporoparietal Junction (TPJ)
- Functional Magnetic Resonance Imaging (fMRI).
- Electroencephalography (EEG).
- Positron Emission Tomography (PET).

INTRODUCTION

> *(The conscious being)... when put in front of his scissors, needle and familiar tasks, does not need to look for his hands or his fingers, because they are not objects to be discovered in objective space: bones, muscles and nerves, but potentialities already mobilized by the perception of scissors or needle, the central end of those 'intentional threads' which link him to the objects given. It is never our objective body that we move, but our phenomenal body, and there is no mystery in that, since our body, as the potentiality of this or that part of the world, surges towards objects to be grasped and perceives them.*
>
> Maurice Merleau-Ponty, Phenomenology of perception, 2002, pp. 121.

Cognitive science is inherently interdisciplinary, and as such, it intends to integrate diverse perspectives in order to study cognition. This interdisciplinarity entails an ongoing and evolving discussion about phenomena as complex as consciousness; a growing body of research has examined the differences between modalities or layers of self-consciousness (see Adler et al., 2014; Bortolan, 2019; Candia-Rivera, 2023; Dary & Lopez, 2023; de Vignemont & Alsmith, 2017; Eddy, 2022; Feinberg, 2011; Glasgow, 2018; Heinämaa, 2017/2015/2022; Nash, 2024; Pacholik-Żuromska, 2022; Sattin et al. 2021; Schneider et al, 2008; Tisserand et al., 2023; Wehrle, 2022; Zahavi, 2005/2007).

Within this literature, the narrative or reflective layer of self-consciousness is often described as a voluntary, explicit, and objectifying form of self-examination. It involves higher-order cognitive abilities such as self-recognition and the capacity to direct attention toward one's own thoughts, emotions, and feelings (Bermúdez, 2010; Blanke & Metzinger, 2018; Block, 1995, 2005). In this sense, self-consciousness is broadly defined as the awareness of oneself as an individual subject, encompassing a set of self-referential cognitive acts in which the conscious subject becomes the object of its own attention.

By contrast, this research focuses on a pre-reflective or most basic modality of self-consciousness, which though it is less frequently discussed it is yet fundamental, and refers to a non-objectified, tacit sense of self that accompanies the stream of conscious experience. It is characterized by its immediate, implicit articulation of the latter, prior to reflective or representational acts. This research proposes a philosophical examination of the structure of pre-reflective self-consciousness, bridging phenomenological insights on passivity, affectivity, and temporality within an scoped interdisciplinary discussion. In doing so, it advances a threefold conceptual framework that accounts for the finitude, embodiment, and intersubjectivity of self-conscious experiences.

Pre-reflective aspects of experience underlie the way we engage, deal with the world in everyday situations, without continuously making self-related inferences—without explicitly reasoning about how to move our limbs or how to think the thoughts we are thinking. Pre-reflective self-consciousness has been proposed as influencing diverse aspects of the conscious organism, ranging from affectivity

and movement, to habits and intellectual acts (Heinämaa, 2015). It has been characterized by its passive articulation in the stream of lived experience before reflective acts (Biceaga, 2010; Heinämaa, 2007; Husserl, 1962; Zahavi, 2005). According to Heinämaa (2022), pre-reflective self-consciousness is shaped from its origins by ipseity, understood as self-continuity or unity, which defines the being of consciousness (Zahavi, 2005). In this line, Merleau-Ponty (2010) argues that the basic modality of self is a condition of "being close to oneself," a tacit cogito. Differentiating the notion of the pre-reflective self is therefore key to understanding subjective experience (Zahavi, 2005).

Furthermore, to clarify more on the distinction between reflective and pre-reflective layers of self-consciousness, it has been pointed that pre-reflective self-consciousness is not an active set of cognitive processes, as reflection is; neither is a pure sensitive, embodied feeling, significant only in emotional and affective terms. Rather, it constitutes the minimal, structural background of self-consciousness that makes conscious experience possible. In terms of Frank (2015), the basic modality of self-consciousness is a non-thetic, non-positional, or non-objectifying (*non-setzende*) consciousness (Frank, 2015),

This work introduces a threefold framework—passivity, existential affectivity, and finite temporality—as a way to articulate the minimal structure of pre-reflective selfhood. This section provides a delimited review of literature within philosophy of mind, neurobiology, and developmental psychology, accounting for studies on self-consciousness and its most basic or minimal layers. The section of Methods clarify various phenomenological notions and claims, in order to explain how this work is elaborated. Later, in the Development of the research: How pre-reflective self-consciousness is articulated, phenomenological notions and claims are rigorously considered in order to claim that self-consciousness is an accomplishment of co-constitution along with its intersubjectivity, embodiment, and finite condition.

PHILOSOPHY OF MIND ABOUT THE SELF

Philosophy of mind has long grappled with the problem of self-consciousness, from Descartes' cogito to contemporary higher-order theories. Central to these debates is the distinction between reflective self-awareness, which objectifies the subject, and more basic forms of self-consciousness that resist reduction to cognitive acts alone. This review establishes the theoretical and empirical context of the research, examining concepts from philosophy of mind (beyond phenomenology), developmental psychology, and neurobiology, in order to situate the proposed framework within contemporary debates on consciousness. This section also examines how philosophers have defined self-consciousness, the limits of higher-order theories, and the need for a phenomenological account that captures tacit, non-objectifying dimensions of experience. The paradigms reviewed in this section have substantially advanced the empirical and conceptual understanding of self-consciousness as a

higher-order cognitive phenomenon. The goal is to examine these paradigms, tracing both their contributions, and the limits that motivate the phenomenological inquiry developed in this research.

Classical higher-order theories proposed that a mental state becomes conscious when it is the object of a distinct, higher-order representation directed toward it. The difficulty is that this account either leaves the higher-order state itself unconscious, and thus unable to ground the consciousness of the first, or requires an ascending series of representational acts, each presupposing another, with no principled stopping point. A foundational problem in the philosophy of self-consciousness concerns its structural reflexivity: how can consciousness be aware of itself without this awareness requiring a further act of awareness, and that one a further still, generating an infinite regress? The response that has gained significant traction in phenomenological philosophy is to study a form of self-consciousness that is non-relational and non-objectifying.

In philosophy of mind and cognitive science, scholars have discussed the idea that perception is immediate and not based on a linear integration of basic elements, though the research into cognition has often focused on mental individual elements or representations to study cognitive and conscious activity. According to Carey (2009), a key distinction arises between empiricist and rationalist perspectives on how these representations are generated: empiricists emphasise the formation of representations through experience, considering them as having a fundamental role in learning. Conversely, rationalists would sustain that innate representational systems in the conscious being analyse the received input, which is transformed, through computational-like processes, into perceptual, “veridical representations of the distal world” (p. 448), before any learning experiences of the subject. Representational acts have a lingüistic structure, as they are characterized by their explicit expression, they have been proposed as a core component of reflection, as public or personal it may be (Borner et al, 2019).

Reflection works through the scoping of a particular element from the field in which we find the specific knowledge of the object which we are able to provide; functions accounting for reflective self-consciousness include introspection, empathy, mental state attribution, first-person pronoun use, and pretend play (Derégnaucourt & Bovet, 2016). Additionally, higher-order cognitive activities such as long-term memory (Weiler et al, 2016), metacognition (the ability to reflect on one's own thoughts), and other set of cognitive skills are considered though frameworks as the Mirror Test, the narrative identity, the theory of mind, the theory-theory and the metacognitive studies. Some of them have proposed a reflective self-consciousness account for the social dimension involved in the propositional capacities that language implies, as well as the role that temporality and the understanding of the passage of time itself have in memory and the understanding of self-consciousness (Zahavi, 2012).

Within this representationalist tradition, Block (1995) proposes an influential distinction. Access consciousness (AC) refers to conscious processing that is explicit and easily verbalized; while phenomenal consciousness (PC) pertains to the sensory awareness we have of our experiences. According to this model, many linguistic processes are “unconscious” and vital for our overall comprehension of language (Block, 2005). Supporting the idea that our cognitive systems are complex and layered in terms of consciousness, contemporary research (e.g., Weiler et al., 2016) discussed how syntax and phonetic processing can happen without our conscious awareness.

The question of whether the self is a real feature of conscious experience or a post-hoc construction remains one of the most contested in philosophy of mind and cognitive science. Metzinger (2003) argues that the self is a phenomenal self-model, a representational construct generated by neural processes that lack the capacity to recognize their own representational character, thereby producing the illusion of a genuine subject. Dennett (1991) advances a related position, characterizing the self as a "center of narrative gravity", a useful fiction stabilized by the stories organisms tell about themselves, without any corresponding metaphysical reality. Against these eliminativist and constructivist positions, Zahavi (2005) and Henry (2008) argue that conscious experience is irreducibly characterized by first-personal givenness: unless an experience is felt as mine, unless it possesses a pre-reflective *for-me* structure, it does not qualify as a conscious experience in any phenomenologically adequate sense. This is not a claim about narrative or representational self-attribution but about the most basic structural feature of experience as such. For the framework developed in this research, the phenomenological position is foundational: the pre-reflective self is not a model or a fiction but the structural condition of possibility of any conscious experience, including those in which a self-model may subsequently be constructed.

Self-recognition is studied within the mirror test paradigm, an experiment that involves placing a little mark on the face of the child or the animal, and then evaluating their reactions when they look at themselves in a mirror. This paradigm has helped us to observe the display of explicit self-recognition behaviours, as well as the skills on which it is based (Meltzoff, 2011). Recent studies have enriched this paradigm to understand both the developmental trajectory of self-recognition, and the influence of cultural factors always present as a person grows and develops, and how they influence the development of reflective self-consciousness (Rochat et al, 2020). Criticism of this paradigm has been around the claim that before the test can be completed, babies are observed to be aware of others’ attention, not in a way they are aware of being the object of their visual attention, but in terms of being a participant of a shared activity, i.e. joint attention (Rochat, 2004; Ciaunica, 2015).

Also, by framing self-consciousness as the active use of inferencing skills, narrative identity paradigm studies the set of abilities that allow us both, to make a mental representation of ourselves in time, and also to have the awareness of this representation. Narrative self-consciousness is based on the ability

of the person to obtain an “internal image of themselves” from observing, interpreting, and having inferences about their own physical and mental states (Legrand, 2017, p. 577). In other words, it focuses on the cognitive processes involved in taking one's being as the object of attention; hence, other implicit self-related activities are relegated to a level of unconscious processing and, therefore, marginal to self-conscious experience.

Premack and Woodruff (1978) proposed the theory of mind (ToM) as the capacity to attribute mental states to oneself and others, based on an inference system, as a set of scientific theories or "a theory", that allows us to make predictions about others’ thoughts, based on their behaviours, but moreover, in our own inferred mental states. As mental states are not directly observable, this inference system implies that understanding others’ thoughts is based on the construction of hypotheses about unseen phenomena (Tanaka & Tamachi, 2011). This ability is crucial for other cognitive activities, such as understanding that what other people think may be different from what one thinks. This paradigm has been largely enriched by the mirror test paradigm, which by studying self-consciousness as a conglomerate of self-recognition and self-referred inferences, "constitutes the triangular stone" (Derégnaucourt & Bovet, 2016, p.8) of the ToM.

Apperly and Butterfill (2021) reviewed how the ToM develops through early childhood by considering the neural and cognitive mechanisms involved. It has been suggested that the ability to represent others' mental states, the ToM develops between four and six years of age (Astington, 1993). The "false-belief task" studies how children understand others’ mistaken beliefs, observing that children younger than four years old struggled to identify where “Maxi”, a fictional character, would search for his chocolate after it was moved when it was not present, while older children succeeded (Apperly & Butterfill, 2021). These variations of the task have reinforced the claim that most children acquire a representational ToM by this age.

Conscious self-monitoring, based on the notion of self-awareness (SA), has been studied to provide, also in terms of metacognition, the ability to consciously monitor, and regulate both cognitive processes, such as memory, comprehension, as well as problem-solving strategies, and behaviour (Fulton & Miyake, 2019); metacognition has also been related in facilitating learning among individuals (Lou et al., 2016). Comprehended as a higher-order monitoring system, metacognition is composed of metacognitive knowledge, the awareness and understanding of one's own cognitive abilities and the context of the task, and metacognitive regulation (Lou et al., 2016). Meta-metacognition extends the study of metacognition to focus on the reflections about one’s capacity to engage in metacognitive activities, evaluating the accuracy and efficacy of one's metacognitive judgments (Drigas & Mitsea, 2020).

Within the agentive identity paradigm (Barret, 2017b), the sense of agency involves the perception of which signals are self-originated, and in this way, they argue that self-perception is tied to the ability to infer internal mental states and differentiate them from external expressions. Based on self-perception theories of emotion, the sense of agency is understood in the study as the feeling of control over both the actions generated by oneself, and their consequences (Tian & Poeppel, 2015). Goupil et al (2019) also examined how subtle manipulations of vocal self-perception influence emotional experience: participants who did not explicitly detect vocal manipulations in their own voices reported emotional changes corresponding to the manipulated cues, for example, listening to a high pitch in the voice led to feelings of happiness or arousal. Moreover, when participants detected the vocal manipulations, the emotional effect caused by the alteration was nullified, by what the authors called explicit and implicit compensations. In another experiment, the authors accounted for interesting phenomenal aspects of joint interaction, like the sense of togetherness, in dyads performing simple actions in the context of musical improvisation (Goupil et al., 2019). The sense of togetherness has been observed to be influenced by factors such as the group size, the interactional patterns within the group, and other aspects related to the sense of self, such as the sense of agency, the agentive identity, the integration of oneself with the others, the dependence of oneself with the others, and the reflexivity about oneself.

Is self-consciousness an inherent part of *all* conscious experiences? From cognitive sciences some authors argue that if we are not self-conscious in any conscious act, then we will have experiences concerning not the self, but the contents of consciousness only; moreover, based on the experience of a sense of unity, Lou et al. (2016) align with the view of an integral organization of all conscious experiences, which they explain as self-awareness (SA), unifying them into a single construct. The authors consider this question to remain important, moving beyond the “hard question” of consciousness, which seeks to explain how physical processes give rise to the phenomenal experience, or the “what it is like” (qualia) of experience, according to them, inaccessible to science. They study self-awareness (SA) as correlating with the paralimbic network, a neural architecture which makes the information available for conscious self-monitoring, and metacognition.

In this empirical and philosophical line, the production of afferent copies theory considers proto-conscious, internal nervous signs occasioned by a certain movement, as afferent copies predicting certain sensorimotor consequences (Eddy, 2002). According to this theory, afferent copies help to distinguish between external and internal stimuli in a process that highly influences space perception. The representations formed are not only about stimuli but about the self-position in the specific space, too. Hence, it is argued that the afferent copies have a basic influence in self-reference processes; as movement efference and predictive sensory feedback, these copies have been proposed as providing basis for mechanisms influencing the self-other distinction. The peripersonal space, the

near space around the body, is codified in the part of the body performing the action, in a "multisensory, in a body-part-centered and modular manner", and it is structured by the bodily activities of the subject (Legrand et al., 2007, p. 694).

Stern (2018) proposes various notions of the concept of self; between them, the "core self-with-another" or "intersubjective self" can be characterized by being closer related to intersubjectivity. This kind of self is the basis for us to "synchronise our movements with others who are engaged in movement" with us (p. 34). Following Stern, Welch (2014) argues that in these studies of the self there is a discussion already in place around the four elements studied by the 4E cognition approaches (embodied, embedded, extended, and enactive cognition). The author argues that this is achieved by observing the development of "a way-of-being" depending on the day-to-day, repeated and small patterns of interaction of a person with the things and people of their environment.

Taken together, the paradigms reviewed in this section offer an empirically grounded explanation of self-awareness as a higher-order cognitive achievement. Representationalist frameworks study how conscious experience is structured through inferential and linguistic processes; mirror recognition testing and narrative identity paradigms trace the evolutionary and autobiographical dimensions of self-awareness; theory of mind and metacognition explain the reflective capacities that allow organisms to monitor and attribute their mental states; and agent identity research reveals how the sense of self is dynamically linked to the perception of self-generated action.

However, each of these paradigms, precisely because of its focus on forms of self-awareness, leaves a fundamental question unanswered: what sustains the continuity of self-awareness through and under these higher-order acts? A narrative self presupposes a self that persists through narration; a metacognitive agent presupposes a self already present to its own cognitive states before monitoring them; the sense of agency presupposes a self already oriented toward its own actions before inferring their origin. Studies on consciousness need to account for the most basic layers of self-awareness.

It is precisely this gap that motivates the phenomenological approach developed in this research. This is a structural gap, since these frameworks start from notions that correspond to secondary layers of self-awareness; thus, they cannot explain what makes such activity possible in the first place. Drawing on the Husserlian tradition and its contemporary elaborations, the following sections argue that prereflective self-awareness is a fundamental, passively, affectively, and temporally articulated structure of all conscious experience.

PHENOMENOLOGICAL PHILOSOPHY ABOUT THE SELF

Phenomenology offers a decisive shift to the dominance of computational models by providing an ontological, and transcendental stance to argue that self-consciousness is always passive, affective, and temporally structured, as consciousness cannot be adequately explained without reference to embodiment, intersubjectivity, and existential finitude. In this context, phenomenology provides conceptual resources to interpret the pre-reflective dimension of experience, that studies focused only on the reflective self-consciousness often abstracts away. In this way, this section positions the proposed framework as a contribution to this critical turn in cognitive science.

In the Cartesian expression *ego cogito*, the cogito as “I think”, is a notion that scopes the different acts and states of the conscious act, including those of the emotions and feelings. Though this has been a crucial step for cognitive science and philosophy of mind, the claim of Husserlian tradition is that what is primordial is not the “think”, but the “I” oriented pole towards the world. Heinamaa (2022) emphasizes that a self-conscious organism is not merely a cognitive agent but also operates in affectivity, valuing, and motility; in the form of “I feel”, or “I suffer”, or as Husserl (1962) posited, in the form of “I crave”, or “I hope”; or as Merleau-Ponty (2002) remarks, the “I” is expressed in its primary sense as an “I can”, as a *tacit cogito* or implicit cognition, an intimate possibility of movement or action (kinaesthesis), which has been described as "the presence of oneself to oneself” (Merleau-Ponty, 2002, p. 460).

This form of self is continuously oriented towards the world through perceptions, actions, motivations, and so on. The claim is that affectivity, involving the corporal kinaesthetics and movements, results as constitutive as reflective activities for self-consciousness, insofar as the epistemic structures of affectivity are inherently more basic or primal. In this way, this approach accounts for the lived body (*Leibkörper*), which is defined as a constitutive pole of embodied experience, forming the basis for diverse activities from affectivity to intellectual processes (Heinämaa, 2007, 2015; Husserl, 1962, 2001; Merleau-Ponty, 2002; Zahavi, 2005). Drawing on Husserl's analyses of bodily self-constitution, Heinämaa (2014) argues that the sense of the lived body as one's own is originally grounded in the structure of self-touching: when one hand touches the other, the body is simultaneously given as a sensing subject and as a sensed object, neither pole reducible to the other. This double givenness, which Husserl terms double sensation (*Doppelempfindung*), is not a reflective achievement but a pre-reflective structure of embodied life, constituting the most primordial layer of self-presence available to the conscious organism (Heinämaa, 2014; Husserl, 2001).

One of the most critical stances in phenomenology is Merleau-Ponty’s claim that the notion of sensation must rather be omitted if the objective is to provide a rigorous account on perception. According to the author (Merleau-Ponty, 2002), perception is understood as affection, insofar as it

provides the most basic contact with ourselves and others, in such a way we are in the world through our bodies, and at the same time, we are in our bodies through the world. In this framework, perception is understood as a coherent, intentional activity for someone oriented towards a cohabited world with others, who is affected and engaged in existential terms, and that is pragmatically dealing within its particular everyday life.

In this line, another important phenomenological claim is about the essential relationship between the self and the common word, or life-word (*Lebenswelt*). Distinct from a scientific, objective conception of the world, the life-word refers to an immediate, pre-scientific layer of experience that is composed of everyday practical comprehensions, based on the perceptual experience for someone within the everyday things (e.g. tools, utensils, instruments), the affective orientations (e.g. life projects, motivations, attractions or repulsions) of herself and others, as well as the scientific theories and popular meanings within the social communities, political institutions and surrounding power dynamics (Ahmed, 2006). Some scholars have discussed how intersubjectivity accounts for the implicit belief that things are there "for you", as much as they are "for me". Ciaunica (2019) explains this notion as the condition of multi-perspectivity, or the ability to share the assumption of the world among peers. Moreover, some phenomenologists have claimed that intersubjectivity is passively shaped by affectivity, as finite self-conscious bodies are in contact with the world in such a way it performs a passive, affective allure, or attraction upon them (Biceaga, 2010).

For Husserl (2001), the reflective self is studied through the notions of wakeful ego, the center of lived-experiencing, the identical pole of actions and passions that is actively engaged in its conscious acts; and the pre-reflective self is accounted as the background of lived-experiences that accompany the wakeful ego, in such a way though the conscious organism is not actively present or directed to the background, the latter forms a constant horizon for the first; e.g. experiences such as unnoticed stimuli (Biceaga, 2010), affects, or drives. Heinämaa (2007, 2022) provides a systematic reconstruction of Husserl’s mature phenomenology of the self, arguing that the transcendental ego is an inherently temporal and developing formation rather than a static or formal principle. This self is not limited to cognitive activity; it is characterized as affective, emotive, valuing, and striving, existing not beyond time but as a trans-temporal process of constant change. Crucially, the claim is that the constitutive foundation of the world does not reside in a solitary, isolated ego, but in transcendental intersubjectivity, where the full sense of objectivity is achieved through a community of interlinked selves. Departing from the observation that rather than arising from one state being directed toward another, consciousness is characterized by an intrinsic, pre-reflective self-manifestation that belongs to it as such, without splitting experience into an observer and an observed.

This conception of selfhood is articulated through a tripartite conceptual framework consisting of the act-pole, the personal ego, and the monad (Heinämaa, 2022). The act-pole (*Ego Pol*) serves as the

identical, centering subject from which all intentional acts radiate. The personal ego, or "person" (*Personales Ich*), is defined as a temporal gestalt or formation constituted through the habituation (*Habitus*) and sedimentation of these acts within internal time, giving the self an individual history. Finally, the monad represents the self in its absolute concreteness, encompassing not only its acts but also its intentional objects, thereby establishing the necessary connection between the self, the world, and other egos.

The temporal horizon is defined as the continuum that articulates each experience while projecting anticipations for the next to possibly happen (projections), based on what just happened (retentions). It is key to distinguish the notions of retention and protention, from the terms that account for reflective activities such as past memories recollection, future-events planning, or explicit expectation or purpose (Husserl, 1986); i.e. retentions are the passive holding-on to the immediate past as it fades, while remembering is an active, new "re-presentation" that reconstitutes a past event in the mode of the reproduction (Husserl, 2008). Although retentions are oriented to the elapsed phases of the object, the just-lived or just-having-been, it is itself simultaneously a now, and something currently existing within the stream of consciousness.

This dual role -present while intending the past- is based on the concept of double intentionality: horizontal intentionality (*Langsintentionalität*), as the dimension of consciousness directed toward the constituting stream of lived experiences itself; its retentions intend the elapsed phases of the flow of consciousness. As the primal impression becomes retention, which in turn becomes a retention of that retention, and so on, the self-retaining characteristic of the flow leads to the concept of "retention of retention" (Husserl, 2008); according to Husserl (2008) this retention is essential for the pre-reflective self-manifestation of our acts and experiences. Transverse intentionality (*Querintentionalität*) is the dimension oriented toward the object that is being constituted as temporal, intending the elapsed phases of it; the author claims that we can only be pre-reflectively conscious of the stream of consciousness when we are conscious of the duration of the object, and vice versa: since the retentional phase of the stream of lived-experiences originally intended a phase of the object as its current-now through its primal impression, when retaining the elapsed phase of the flow (horizontal intentionality) also retains the elapsed phase of the object correlated with it (transverse intentionality).

In this way, phenomenological philosophy avoids the infinite regress found in higher-order or self-representational theories: instead of being mediated by internal representations, conscious experience is fundamentally self-present and immediate, insofar as consciousness necessarily implies a basic form of self-consciousness. On this account, the regress is avoided by reconceiving the structure of conscious experience itself, as something that is given to itself without thereby becoming its own object. It is this conception of pre-reflective self-consciousness that this work takes as its point of departure, and whose passive, temporal, and affective articulation it seeks to elaborate. This

emphasizes how embodied conscious organisms, while constituting meaning through intentional, temporal acts, are at the same time, being shaped by their continuous sense of the self in each one of these acts. In other words, the basic modality of self is constantly structuring the conscious being experience, and, at the same time, being structured by it. As I will argue, in its most basic and pre-reflective modalities, it may be characterized by existential affectivity, passivity and finitude.

DEVELOPMENTAL PSYCHOLOGY ABOUT SELF-CONSCIOUSNESS

Developmental psychology explores infants' basic sensorimotor activities and early social interactions during their formative stages. On one hand, we have the intricate interplay among various dimensions of self, and of the relationship with others. And, on the other we observe how this interplay evolves, providing the way for richer relational frameworks that characterize human social life, even before babies learn to speak. Paradigms such as the minimal self, dyadic interactions, ownership and agency, embodied coupling, and multimodal coordination are reviewed to enrich the discussion about self-consciousness. Here, the focus is on the emergence of minimal self-consciousness in infancy and early childhood. Studies on sensorimotor development, affect regulation, and intersubjective attunement demonstrate that pre-reflective self-awareness is co-constituted socially and bodily, not merely cognitively.

The minimal-self paradigm studies an immediate, non-conceptual sense of self-experienced through bodily sensations and actions. The minimal self is defined as the most basic awareness of oneself, often referenced as the foundational layer of self-awareness that emerges through early sensory experiences (Rochat, 2003; Rochat & Zahavi, 2011). Infants begin to recognize their own agency through simple actions like reaching or grasping, which implies a rudimentary understanding of the self as a separate entity poised within an experiential context. This emerging self is not yet articulated through language but is deeply rooted in sensorimotor feedback and the more visceral feeling of being an active participant in one's surroundings.

When neonates (24 hours old) receive tactile stimulation, such as a touch on their cheek, they can distinguish between self-generated and externally generated touches. Fivaz-Depeursinge et al. (2004) observe that the response from babies to external tactile stimulation occurs nearly three times more often than when they touch themselves. This is, they can differentiate between double-tactile stimulation (along with proprioception) and punctual or single external stimulation, depending on whether they originate from their own body or an external source. For instance, when the corner of a baby’s mouth is touched, the baby turns their head and opens their mouth toward the source of stimulation.

In a related study, Moran (2017) discusses how communication occurs between a mother and her unborn baby, revealing the baby's gradual adaptation to the rhythm of the mother's language. This adaptation involves the baby's movements synchronising with the mother's tone of voice and sound patterns, indicating a basic self-awareness in response to her feedback. Kruegel (2011) explores how 18 weeks prenatal baby's nervous and cardiac responses differ when listening to the mother's voice compared to other stimuli, highlighting their ability to perceive differentiated stimuli and coordinate certain motor responses during these interactions. This suggests a minimal sense of self, as the baby demonstrates a motor response based on prior familiarity with the caregiver.

Legrand and Ruby (2019) propose to account for the minimal self by focusing on the sense of agency (having control over the own actions, a kind of “I did it” or “It was me”) and ownership (having a sense that one’s body belongs to oneself, pointing to a sense of “This part of my body is mine”). Observations were that three-month-old infants displayed a preference for self-produced movements over the externally produced ones; even in conditions of delayed visual feedback. They use measures obtained from sensorimotor tasks, along with techniques like real-time motion and virtual reality (VR) to manipulate the experience of the infants.

Dyadic interaction paradigm provides valuable insights into the relationship between self and others, typically by studying the reciprocated and attuned actions during the early stages of an infant with their caregiver (Ferroni & Hansson, 2021; Meltzoff & Brooks, 2020). Caregivers often mimic infants' facial expressions, and this imitation is often paired with an emotional mirroring of the infant's arousal level (Ciaunica, 2015). As Farmer et al. (2018, p. 11) explain, babies detect "the social contingencies between their own actions and external responses", and they are also especially "sensitive to the imitative quality of the response” from the caregiver. In other words, infants respond to their caregivers' facial imitation and arousal mirroring, showing some degree of comprehension of the social connections between their actions and the external responses, as well as sensitivity to the imitative expression of their caregivers' replies. According to the authors, through shared gaze, vocal turn-taking, and synchronised gestures, infants engage in mutual responsiveness that is based on emotional attunement and early layers of empathy, forming the basis for more advanced social cognition.

Based on interactions of attunement, coordination and shared attention between peers, joint attention paradigm has helped to enrich the studies on the relation self-other. Reddy et al (2020) account for the relationship between joint attention and early face-to-face interactions with self-consciousness; they propose that early dyadic interactions, in which there is some degree of matching or reciprocity, are crucial in the development, or as they say, the emergence of the awareness of oneself as a distinct organism in relation with others. Ciaunica (2015) has called embodied coupling to the deployment of the sensorimotor, perceptual, and affective abilities that allow the growing being, from early

interactions, to be involved in a contextualized way without dealing with the situations as a mere reflective observer of the behaviour of others, but as an active, always engaged part of a context of shared meaning.

In a longitudinal approach, Kokkinaki et al (2016), studied dyads of infant-mother across time and at home, from the second to the sixth month of life; they also accounted both for “matching”, coordinated and “not matching”, non-coordinated emotional facial expressions. The “emotional non-matching” behaviours corresponded to those in which neither the baby nor the caregiver showed interest in interacting with each other. Some observations are that contextual differences influence the way these activities occur, for example, if there is a context or period of affectionate and mutual attention, or rather is a changing context, or maybe a period of negative emotions, and so on.

Multimodal coordination further enriches our understanding of the development of the sense of self by illustrating how varied sensory modalities—visual, auditory, and tactile— are involved in basic layers of social dynamics (Müller et al, 2014). The ongoing co-occurrence of adjustments and modifications both in the bodily movements and in the speech by each participant of an expressive act, or when two or more people interact has been called synchrony of interaction. Some adaptations occur specifically in the starting, ending, rhythm and speed, orientation, and duration of expressive behaviours (Müller, 2014, p. 1302). This coordination transcends mere imitation, as infants begin to anticipate and adapt to the actions and intentions of others, through basic capacities of perspective-taking and joint attention.

The developmental paradigms reviewed in this section collectively pointed to a foundational finding: the most elementary forms of self-awareness observable in infancy are not cognitive achievements but embodied, affective, and intersubjective ones. Neonatal self-other discrimination, prenatal attunement to maternal voice, sensorimotor ownership and agency, dyadic emotional synchrony, and multimodal coordination all precede and undergird any reflective or linguistically mediated form of self-consciousness. Crucially, none of these capacities requires an objectifying relation to the self: they operate implicitly, continuously, and without deliberate attention. These findings are not merely consistent with the phenomenological notion of pre-reflective self-consciousness — they provide its empirical correlates. The passive, intersubjectively constituted, and temporally structured self described in the phenomenological framework developed in this research is already visible here, in its earliest and most elemental form, as a bodily-affective orientation toward the world that is co-constituted from the very beginning in relation to others.

NEUROBIOLOGICAL CORRELATES OF SELF-CONSCIOUSNESS

This section reviews empirical findings on bodily awareness. It shows how neuroscience and neurobiological research has illuminated the mechanisms of bodily awareness, yet these findings often abstract away the lived orientation and affective significance of experience. Considering the most autonomous and evolutionarily primitive processes, Panksepp (2007) proposes the term proto-self referring to a primitive form of self-consciousness rooted in basic sensory, motor, and emotional processes, that have been observed to activate subcortical structures. The claim is that the proto-self is an automatic response to the internal and external demands placed on the organism, and it is crucial for survival, providing the organism with a sense of its own physical boundaries and basic needs. The core subcortical regions involved have been traditionally associated with basic survival functions like defence mechanisms and pain regulation: the periaqueductal grey (PAG), the colliculi, and the tectum are correlated with the autonomic organization of the responses of the body to environmental stimuli.

Considered as the most basic correlate of the proto-self, a collection of neural patterns in the PAG, hypothalamus (involved in homeostatic processes), and insula have been related with monitoring the internal bodily state when interacting with the environment (Mizen & Hook, 2020). The PAG plays a role in mediating the affective and visceral components of the proto-self, allowing the organism to integrate sensory information and react accordingly (Panksepp, 2007). Autonomic impulses are integrated by the insular cortex, a crucial centre for processing interoceptive information, as the activity in the anterior insula correlates with interoceptive accuracy and self-referential processing (Critchley et al., 2020). The vague nerve, a vital conduit that affects social interaction, stress reactions, and emotional regulation, is involved in the way the autonomic nervous system (ANS) and central nervous system (CNS) communicate; the incorporation of physiological cues into conscious perception is facilitated by a reciprocal connection.

Damasio (1999, 2003) has particularly studied the insula for its role in linking emotional states with conscious feelings insofar as its activation helps individuals contextualize their environment meaningfully and allows them to receive homeostatic information via the thalamus while maintaining close communication with the limbic system. Moreover, Critchley et al. (2013) argue that emotional experience relies on the integration between the ANS and limbic structures. Maier et al. (2019) postulates that vague nerve stimulation enhances emotional regulation by modulating activity in the insular cortex, and in the amygdala, which assigns emotional value to bodily states and enhances their contribution to conscious awareness. Interoceptive awareness is understood as the ability to sense interoceptive signals, and its activity is correlated with improved emotional regulation and decision-making, as it allows us to interpret embodied somatic signals as emotional cues informing our cognitive decisions.

It has been discussed how bodily signals, including posture and interoception, influence cognitive processes such as decision-making; for this, Park et al. (2018) propose that by connecting autonomic signals to the conscious feeling of self, heartbeat-evoked potentials (HEPs) offer a brain correlate of interoceptive awareness. Laborde et al. (2018) observed that the heart rate variability (HRV) is higher when greater is the activation of interoceptive awareness and emotional resilience, suggesting that autonomic flexibility supports a stable sense of self. In another experiment, participants that exhibited better heartbeat detection accuracy, were in the group with more adaptive decision-making evaluation (Dunt et al., 2010).

Tsakiris & Critchley (2021) have particularly addressed explanations on how the brain integrates interoceptive signals into a continuous and coherent sense of self, by observing how the anterior insula and the anterior cingulate cortex (ACC) are active in the integration of interoceptive signals with emotional and cognitive processes. The role of ACC has been discussed to be functioning as a centre of integration of autonomic information into conscious perception, Fardo et al. (2020), using functional magnetic resonance imaging (fMRI), demonstrated that greater activity in the anterior insula correlates with improved interoceptive accuracy.

The default mode network (DMN) is defined as a core system active during conscious states, such as those of self-generated activity e.g. memory recall, future planning, and simulating hypothetical scenarios (Fox et al., 2016; Schneider et al., 2008), and those of mind wandering (Northoff, 2017), or idleness or resting state (Lou et at., 2016). This brain network is characterized by displaying suppressed activity during cognitively demanding tasks, focused on external stimuli, while displaying high neural activity during state of rest, quiet wakefulness, and during internally focused thought (Beckmann et al., 2005; Panksepp, 2009; Scalabrini, 2020); hence, it has been argued, that DMN reflects a shift toward internal processing (Northoff et al., 2011).

The cortical midline structures (CMS), a set of medial cortical regions centrally involved in self-referential and identity integration processes, function dynamically, active when individuals distinguish self-related from non-self-related stimuli, and show increased activation during tasks requiring self-reflection, such as recalling autobiographical memories (Northoff et al., 2011; Schneider et al., 2008). Northoff (2017) claims that CMS are instrumental for the conscious organism to maintain a stable and adaptive sense of self (Northoff, 2017). Fox et al. (2016) have studied the amplitude of cortical activation with self-generated thoughts of the CMS regions, and particularly, its overlapping with the DMN and the frontoparietal control network (FCN) regions.

A zone in the middle of the cognitive association of interoceptive and exteroceptive content, the TPJ, has allowed us to see the link between self-activity with areas such as the thalamus and the ventromedial prefrontal cortex (vmPFC). The discussion about how CMS and the DMN are

intrinsically linked has pointed to the claim that CMS often constitutes the core anatomical hubs of the DMN (Northoff et al, 2011; Northoff, 2017; Panksepp, 2009; Scalabrini et al, 2020; Schneider et al, 2008; Weiler et al, 2016); as well, that both networks are crucial for internal processing, particularly self-referential processing (Northoff et al, 2011). The paralimbic hubs within the DMN are observed to be functionally connected by ~40 Hz oscillations (gamma), and its connection and synchrony has been discussed as key in facilitating the "access" to consciousness (Lou et al., 2016). The observed oscillations have been explained by the rhythmic GABAergic inhibitory activity in interneurons. According to the Lou et al. (2016), self-awareness is regulated by dopamine, a neurotransmitter which enhances paralimbic synchrony as it activates the GABA system in the anterior hub, and in the associated right insula. The interneurons responsible for paralimbic synchrony have a very high metabolic rate, which generates more energy needs. Neurobiologists have discussed how higher metabolic necessities make the paralimbic network, and thus, SA and metacognition, highly vulnerable to conditions of disturbed energy supply, such as disruptions in oxygen, and glucose homeostasis.

Blood oxygen level dependent (BOLD) signal is a measure used in fMRI that tracks changes in blood flow reflecting neural activity (Wu & Morales, 2025). Negative BOLD response (NBR) has been observed prominently within the CMS, and hence, the DMN; NBR is a neurophysiological response critical for understanding brain function, both during rest and task engagement, observing a high baseline activity of the DMN, attenuated or suppressed when the individual shifts attention away from internal thoughts to an external, demanding task (Weiler et al, 2016; Northoff, 2017). Hence, the negative BOLD response is interpreted not as an absence of activity, but as the neural network responsible for continuous internal self-monitoring being dynamically inhibited to prioritize the execution of the external task, illustrating a reciprocal modulation between internal (self-related) and external (task-related) cognitive processes (Panksepp, 2009).

According to Serino et al. (2013), we experience our bodies as our own, while experiencing ourselves as "occupying a given location in the world with a given perspective" (p. 1248). The authors explain that activities related to having a body (body ownership) are implemented in the premotor cortex, while the ability to possess spatial awareness in a body (self-location) is located in the temporoparietal junction (TPJ), which is an area of multisensory integration, which receives and combines convergent signs (tactile, visual, proprioceptive, and vestibular) based on the body's orientation in its surroundings. Actually, the neurobiological findings reviewed in this section trace the substrates of self-consciousness from subcortical survival circuits to cortical midline networks and distributed interoceptive-exteroceptive integration.

Taken together, these reviews suggest that the neural basis of self-related processing is not localized in a single region but distributed across systems that operate continuously, independent of deliberate

self-conscious acts. The baseline activity of the DMN and CMS, the interoceptive integration of the insular cortex and ACC, the autonomic-limbic communication mediated by the vagus nerve, and the multisensory body-ownership processing of the TPJ all point toward a neurobiological substratum that is ongoing, non-volitional, and constitutively oriented toward the organism's own states and boundaries. These processes correspond structurally, though not reductively, to the dimension of pre-reflective self-consciousness proposed in this research: passivity, as the non-egoic integration of sensorimotor and interoceptive flows; existential affectivity as the felt, emotional valencing of the organism's kinesthetic, proprioceptive, interoceptive and autonomic states; and temporality, as the continuous, non-punctual horizon within which self-related neural activity maintains its baseline coherence.

The present research proceeds from this complementarity — not from the assumption that one level of description can replace the other. The neurobiological evidence does not explain the phenomenal structure of pre-reflective self-consciousness, but it constrains and informs the conceptual account: any adequate framework must be compatible with a self that is constitutively open to its own internal states before any act of reflection. The identification of neural correlates of self-consciousness, however precise, does not dissolve the explanatory gap between third-person neurobiological description and first-person phenomenal experience. As Zahavi (2005) argues, neuroscientific models describe the physical basis of consciousness but cannot, by their methodological structure, account for the phenomenal character of experience.

The regions and networks characterize some neural conditions under which self-consciousness occurs; they do not characterize how it is for that self-conscious being to live within the world with others. This is not a vitalist or anti-naturalist claim but a methodological one (Gallagher & Zahavi, 2012; Northoff et al., 2011): phenomenology and neuroscience operate at distinct levels of description, and the adequacy of neurobiological models depends, in part, on their compatibility with the irreducible first-person facts that phenomenological research makes available.

METHODS

The task of the true phenomenologist became the "destruction" of this heritage, not in order to overcome it but in order to disclose the stratified and mediatory character of the concepts that the tradition hands down to us.

Sara Hainamaa, 2007.

Often viewed as a cognitive agent, the self is conceived as disconnected from embodied, historical, and cultural influences (Heinämaa, 2007). The main claim about self-consciousness, in the discussion within phenomenology, is that there is a basic sense of self which is an integral part of all lived experiences, as a continuous operative set of pre-linguistic, pre-conceptual layers of consciousness. The proposed methodological approach employs phenomenological reductions—specifically the eidetic and the transcendental reduction (epoché)—to isolate and research the foundational self-conscious activities that transcend explicitly self-related cognitive processes. Studying these pre-reflective layers of self has been argued to be a scientific and philosophical necessity for a comprehensive grasp of self-consciousness in cognitive science, or as Zahavi (2005) claims: "investigations on the self and experience have to be integrated if both are to be understood" (p. 106).

Phenomenology is based on the examination of eidetic knowledge, this implies focusing on the pure, invariant structures, intimately inherent features or components of lived-experience (Husserl, 2001; Biceaga, 2010). The eidetic reduction implies for phenomenologists to no longer emphasise the empirical or psychological phenomena, but rather the essence (*eidos*); eidetic knowledge is obtained by studying the essential structural features of experiences, and correlations that make an object the type of object it is when experienced by someone; that make objective meanings possible in the stream of her experience. This makes phenomenology a science of essences (*eide*), with the goal of disclosing or re-discovering the essential structures of lived-experience that transcend particular empirical contexts (Biceaga, 2012; Heinämaa, 2013; Merleau-Ponty, 1969; Zahavi, 2003).

Essential structures are observable in how "the world appears in the way it does, and with the validity and meaning it has" for us (Zahavi, 2017a, p.26). Through the eidetic intuition, we examine the essential structures as core elements of experience that are consistent across concrete imagined variations, and transcend particular contexts of the conscious experience (Husserl, 1950). The *natural attitude*, which is a scientific, reflective or intellectual stance, is characterized by taking for granted epistemological and metaphysical premises and presuppositions, primordially, the belief that there is an external set of objects, an external world (Husserl, 1950; Zahavi, 2003). With the aim of eliminating the validity of the general thesis of the natural attitude, the transcendental reduction applies the *epoché*, which involves suspending (bracketing, placing in parentheses) the natural world, the assumptions, scientific theories, and common-place senses of the world.

The epoché, while not obliterating the bracketed, suspended reality, transforms it by "affecting it with an index" (Husserl, 1950, p. 399) that brings the thing itself for consciousness, in its intimate, simple involvement with the world, or transcendental subjectivity, into the main theme of investigation. Once the focus is migrated to the lived-experience, is then needed to extend the reduction to suspend or disconnect eidetic or aprioristic domains, i.e. formal logic and mathematics (Husserl, 1950), as well as material ontologies of the natural world, as the well as the essential structures extracted from them, i.e. notions as “subject”, “thing”, “person” (Husserl, 1962).

Within a *transcendental attitude* – the phenomenological residue-, the research is organized into different methods, in order to interrogate about the constitutive structures of experience, such as passivity and temporality. The distinction between the methods is claimed to be only ideal, as in practice they are not distinguishable, operating as perspectives about the same phenomenon. Static, or descriptive (*beschreibende*) analysis investigates the formal essences and stable structural relationships at play in the way objective meanings are constituted in the changing flow of experience; in other words, how perceptions are meaningful, how objects are given, and how their identity is constituted by someone. This approach allows one to consider the interplay, or the “structural or essential possibilities of the particular object or act within the intentional correlation” (Husserl, 2001, p. XXXI). A core stable structural correlation discussed in eidetic phenomenology is the one between the noetic (apprehensive act), and noematic (apprehended features of the world) components of intentional acts (Biceaga, 2010).

Through the genetic, or explanatory (*erklärende*) analysis, phenomenology gives account of the constitution of meaning in conscious experiences, and how it is structured in time (Heinämaa, 2007/2014; Husserl, 2001/2008; De Nigris, 2015). Furthermore, this method seeks a genealogy of logic, by examining the pre-theoretical, pre-predicative, pre-linguistic formations of sense and meaning as, phenomenologists claim, they are part of passivity; in this line, passive synthesis or associations are considered transcendental foundations of logic. Genetic phenomenology researches about the origin or genesis of meanings (*Urstiftungen*), and the essential genetic laws which regulate the flowing life of consciousness; it gives account of the conscious bodily experiencer as “bearer of habituality”, and hence, of a “temporal sediment of actions and affections” (Heinamaa, 2007, p. 6, 312), co-inhabiting her intersubjective world. The genetic method often interrogates the reduced static insights, from the perspective of the origin or genesis; i.e. genetic phenomenology departs from the study of the temporal character of intentional acts, to observe the incomplete, unfinished character of the the noematic features of lived experiences (Biceaga, 2010).

In other words, genetic phenomenology studies the “history of constituting consciousness”, and, as Biceaga (2020) explains, the synthetic achievements of passivity, i.e. the correlation between the

"history of the objects of knowledge" (p. xv) - but, more precisely, as Lotz (2007) posits it, "the history of the constitution of an object" (p. 62) -, and the "history of ego" (Biceaga, 2010, p. xv). The genetic analysis applies the phenomenological/eidetic reductions, and based on this trace the steps and phases in the temporal genesis, and constitution of meaning and sense (Heinamaa, 2014). Some scholars have discussed about a third method organizing the phenomenological research, the generative analysis, which investigates problems as the role of the succession of generations in the sedimentation of traditions, birth and death, and the relationship between familiar, homeworlds (*mundos propios*), and unfamiliar, alienworlds (*mundos ajenos*) (Biceaga, 2010; Heinämaa, 2022).

Two important phenomenological claims are crucial for the research about pre-reflective self-consciousness; first we have that consciousness is implied in all the lived experiences, and as each conscious act involves a basic sense of self, a basic form of self-consciousness is implied in all the lived experiences too. And, second, that each conscious act, besides its inaugural present moment (current now) of perception, is also temporally constituted and passively articulated by a structure composed as well of *retentions* (just-past experiences) and *protentions* (anticipations of the immediate future) —in a passive dynamic where the immediate past continuously informs the present before decaying, while the present anticipates the immediate future (Husserl, 2008; Zahavi, 2005). In this way, the temporal horizon is defined as the continuum that articulates each primary association, or current now-perception of experiences with their retentions, and protentions.

The emphasis of this philosophical method on lived experience integrates a theoretical and empirical framework for the discussion about pre-reflective self-consciousness in cognitive sciences, which allows us to examine aspects of consciousness often overlooked in experimental paradigms. The work is primarily theoretical and integrative, relying on the comprehension and interpretation of existing philosophical concepts and findings, instead on the existence or generation of experimental data. In this work the argument is that phenomenology possesses its own methodological rigor and occupies a foundational role relative to empirical science. For this reason, phenomenological reductions are applied in order to propose a conceptual framework to account for the structure of the minimal layers of self-consciousness. The following section presents the conceptual framework arising from this methodological approach

DEVELOPMENT OF THE RESEARCH: PRELIMINARIES ON HOW PRE-REFLECTIVE SELF CONSCIOUSNESS IS ARTICULATED

This section presents the theoretical claim that passivity, existential affectivity, and temporality continuously articulate the most basic sense of self, providing a sense of the continuity of oneself as oneself, or ipseity co-inhabiting the world, not merely in terms of the environment as a collection of objects but as a horizon of potential meanings co-constituted by multiple selves' perspectives. When perceiving, sensory data (*hyle*) is organized into meaningful patterns, first in a passive, pre-theoretical and pre-predicative modality; and later, as tacit, non-representational meaning formations they provide the foundation for subsequent more complex cognitive acts (Biceaga, 2010, p. 16, 19-20). As the world is lived only through the experience of our bodies situated in it; and, since our conscious experiences are intentional, they are always oriented towards what we are being conscious of, then the argument is that consciousness and the world conform to an inseparable whole.

The self is inherently bodily opened, in constant change, referred back to its own past, oriented towards and developing within the temporal horizon of its unique existence, while co-inhabiting the word with others. The changing stream of conscious experiences is structured as a unity, and is fundamentally involved in the consciousness of who we are. Phenomenologists understand that the self is perpetually "becoming"—anchored in its past, engaged with the present, and oriented toward the future: the recent just-past moment decays from, perdures in and affects the current now-perception, while simultaneously the now-perception, fulfilling the current experience, is oriented, anticipating the just-about to happen; as this temporal structure generates pre-reflectively a systematic order of succession, and regularity, in which each new phase carries the other, though contents change from moment to moment, the conscious experience consists of this threefold structure as a unified whole at any given moment (Husserl, 2008).

Temporality is central to self-consciousness, as the claim is about the time implied in our co-inhabiting the word, developing through time, marked by a beginning and end; the consciousness of finitude is not just existential but shapes the structure of consciousness, influencing how existence is oriented in the world. Furthermore, unlike reflective activities, the temporal structure of consciousness operates pre-reflectively, articulating the continuity of the self (Husserl, 2008; Zahavi, 2012; Gallagher & Zahavi, 2014). The temporal structure of consciousness, articulated by the triad of primary impression, retention, and protention, passively integrates the flow of lived experiences into a coherent continuum; this structure provides temporal context and meaning, reflecting a continuous, yet non-punctual, perceptual field with rather a *duration-block* that encompasses past, present, and future horizons. The temporal structure also entails an essential passive incompleteness, with each

apprehension outlining potential new ones. As argued, the passive finite condition forms our experience of time, and this time of the consciousness is the condition that enables affectivity.

Passivity represents the non-volitional, implicit integration or sedimentation of lived-experiences in the temporal articulation of them. It is argued to be a primary open disposition to the environment, rooted in the body, and consolidated through movement and interaction. This notion aligns with Husserl's passive synthesis (1950, 1962, 2008), explaining how pre-reflective unity arises not through deliberate acts but through a sedimentation of experiences and bodily habits, forming a tacit horizon for intentionality and influencing future perception. The passive temporal structure interacts with reflective dimensions, influencing how we are affected by, how we interpret sensory and narrative stimuli, while also being influenced by our own state and comprehension. Some critics have raised concerns that focusing on passivity might neglect individual agency, but this study emphasises its role as a fundamental layer of self-consciousness, particularly through the articulation of temporality, and non-volitional self-affection.

Primary affectivity captures the existential orientation of the self toward the possibilities of its life, understood as a triadic relationship involving anticipative the affective, motivational, future-oriented dispositions, practical provision for oneself and others, and sedimented history of co-inhabiting the intersubjective world (Husserl, 1932; Heidegger, 2000, Heinämaa, 2022). This pre-reflective comprehension shapes how we deal with situations and engage with the world, grounded in the historicity of the human community and personal habits. Affectivity is also deeply linked to the consciousness of finitude, motivating the self's orientation towards what is important within a delimited temporal existence. Existential care (*Sorge*) is an ontological structure that accounts for condition of being-ahead-of-oneself, is an anticipatory engagement which involves implicit structures of comprehension: pre-having (implicit familiarity), pre-seeing (implicit tendency to meanings), and pre-understanding (implicit organization within a framework). In this sense, affectivity in a primary, existential assertion can be defined as a pre-comprehension inherent to the sensible environment which is available to us, previous to any objectifying cognitive act.

The intersubjective world is not merely a collection of objects but a horizon of potential meanings co-constituted by multiple selves' perspectives (Papoušek, 2007; Crone & Huemer, 2018; Di Bernardo, 2022); this horizon or background contextualizes individual and collective experiences, dynamically adjusting the intelligibility of the situations though the engagement with others (Husserl, 2001; Heinämaa, 2022). As we experience our daily life, in which the possibilities of a particular situation are comprehended, projected and imagined, each situation has a meaningful framework of possible subsequent experiences, within which something currently at hand is understood broader, in

terms of the whole background of significance varying through the multiple dimensions of the intersubjective world, pragmatically, artistically, medical, technological, and so on.

Conscious experiences do not take place in a vacuum, our actions are oriented to the co-inhabiting of an intersubjective world that is, in turn, influenced by our movements. The self is not an isolated phenomenon, rather there is a mutual constitution as we exist with others, hence the self is experienced constitutively within the intersubjective world. Through this research, I provide a phenomenological account of the structures of pre-reflective self-consciousness, as the implicit background consciousness of oneself as one navigates the intersubjective world. From a phenomenological standpoint, consciousness is necessarily conscious in all its phases and inherently self-aware (Husserl, 1950, 1962), possessing an intrinsic 'for-me-ness' (Gallagher & Zahavi, 2008; Zahavi, 2005). Within this framework, pre-reflective self-consciousness refers to the background awareness of ourselves that does not require deliberate reflection or the ability to use explicit language, but is present throughout all the conscious activities as a continuous and tacit self-conscious structure.

This research postulates a threefold articulation of the most basic sense of self, pre-reflective self-consciousness, providing with a sense of the continuity of oneself as oneself, or ipseity: i. passivity, accounting for both finitude and intersubjectivity, ii. affectivity in a primordial assertion based on embodiment, and finitude, as well as iii. finite temporality, analysing how it underlies our intersubjective, embodied conscious experience. These three structures – passivity, existential affectivity, and temporality – are not isolated but mutually constitutive. They provide the basis for the pre-reflective self's implicit comprehension of oneself within the intersubjective frameworks of familiarity and intelligibility of the surroundings, which in turn influences reflective self-consciousness.

PASSIVITY

Phenomenology claims that consciousness is not a pure activity, but rather consider that passivity integrates a continuous pre-comprehended meaning of whole background of the object, forming a tacit horizon for intentionality; methodologically, passivity is based on the conceptual hierarchy found in the static, genetic, and generative phenomenological research. The world we cohabit with others, we are open and oriented to, is a lived experience of continuous presence, or presentation that we are both, passively familiarizing with, and actively trying to understand, according to each subjective perspective. In this sense, passivity, defined as the degree of sedimented involvement with the world without the need of active ego inferencing, self-referenced cognitive acts; or the reception of sensations, or perception. For Husserl (2001), the lowest level of active objectivation is the simple

turning-toward, and grasping of a prefigured object in "receptivity", where the self is moved by an affection from the passive background.

According to Husserl, passivity is the receptive level at which associations and meanings are formed prior to any deliberate or contemplative action (Husserl, 1986; Zahavi, 2005); the claim is that there is a passive self-affection which articulates posterior, subsequent world-affections. Being open to the world is a phenomenological notion defined as a kind of existential affective disposition, a world-affection, that stands in a relation of structural co-implication with self-affection (Biceaga, 2010). Self-affection, the body's implicit self-presence, is understood as the openness of the organism to its own bodily intentional experiences (Husserl, 2001; Biceaga, 2010). The relation is not one of identity in the sense of equivalence or fusion: world-affection and self-affection are not the same phenomenon, nor is one reducible to the other; rather, they are constitutively co-implicated: each one is only possible on the basis of the other. The body's openness to the world is conditioned by its capacity to be affected by its own states: to feel its own tensions, rhythms, and orientations as the very medium through which the world becomes available. Conversely, self-affection is not a closed interiority but is always already structured by a world that solicits and orients it. In this sense, the passive openness of the pre-reflective self to its own bodily life and its passive openness to the world are two dimensions of a single constitutive movement, neither of which precedes the other (Husserl, 2001; Depraz, 1998; Oswald, 2014).

Oswald (2014, p. 400) proposes that passivity is a kind of "pre-recognition" or integration of both self-affection and world-affection, involving the ability to imagine the absent, unfamiliar or undiscovered, and yet make it present through this affective integration. In this line, it has been discussed how passivity shapes the relationship between self and other, or as Vameşul (2010) proposes, between ownness and otherness. According to Biceaga (2010), temporal self-consciousness necessarily relies on the world-affection, enriching the interrogation about how the pre-reflective modality of consciousness, argued to be co-articulated by passivity and temporality, necessarily involves the engagement of the self with the others, at their margins.

The passive synthesis takes place in an implicit manner, establishing the pre-reflective basis of consciousness. In this way, De Nigris (2015,p. 119) claims that the embodied self has a pre-constitutive role in world, or "object-constitution" acts; this is, the passive temporal flow of lived experiences articulates the pre-reflective layer of self-consciousness as a tacit, pre-predicative, pre-thematic, implicit comprehension of oneself, within the intersubjective frameworks of intelligibility of the surroundings; which in turns influence our reflective self-consciousness and explicit comprehension of the world. Husserl's analysis about passive synthesis interrogates how the continuity of consciousness arises not through deliberate acts but through the intentionality of

sedimented bodily movements and habits that consolidate the background, horizon of lived-experiences.

The argument is that passive synthesis implies a persistent bodily pre-comprehension or conservation of both world and self, in terms of form and regularity (Bello et al., 2002), through the sedimentation of experiences, "where the previous experiences condition how we perceive and experience the current present" (Zahavi, 2003, p. 95). This conservation, or bodily sedimentation (Merleau-Ponty, 2002) is how experiences are temporally preserved, shaping future perception in terms of the capacity to tacitly comprehend the whole, intersubjective intelligibility of the background or framework of world (Husserl, 1986). Passive sedimentation articulates a pre-reflective framework for intentionality; as Biceaga (2010, p. xx) explains:

> Husserl's accounts of memory, habitus and language, (...) dispute the portrayal of subjectivity as a purely spontaneous production of meaning and challenge the assumption of a neat separation between activity and passivity. Husserlian phenomenology strives to disclose a system of crisscrossing references that connects primary and secondary passivity with eidetic evidence. There is an embryonic eidetic operation at the core of passive associations and all judicative acts have their necessary trains of passive sedimentations. All this makes it apparent that intentionalities are already at work on the passive level and that intentional acts are immersed in or surrounded by passive elements.

Another passive aspect highlighted for phenomenologists is the incompleteness of the world, as we always have the possibility of discovering new faces and profiles of known phenomena, new gaps of knowledge, new information to consider about unknown phenomena, and new layers of complexity between what is not-completely known and the unknown. Husserl explained this in terms of the world not being completely constituted (Husserl, 2008). This all accounts for the omission that phenomenology practices about any constituting subject, but the primordial place the intersubjective world occupies in the phenomenon of subjectivity. So, within the phenomenological tradition, if the question about self-consciousness is also a question about subjectivity and consciousness itself, it is then a question about intersubjectivity too.

Moreover, as passivity is a non-spontaneous, non-volitional synthesis of experience, it is argued to be a central characteristic of the temporal articulation of consciousness (Beith, 2012; Biceaga, 2010; Depraz, 1998; Oswald, 2014), as it ensures the coherence and continuity of the flow of experiences, with the proposed temporal units of experience, retentions (just-lived), primary impression (current-living), and protentions (just-about-to-happen) – are integrated independently of egoic acts, and constitute and embodied conservation of the intersubjective world, not as an object, or arrangement of objects, but as tacit horizon of possibilities for some subsequent intentional acts

instead of others (Ahmed, 2006; Husserl, 1999). According to Husserl (2008) the passive integration of current conscious acts, retentions and protentions form a temporal continuous articulation that is implicitly maintained across all experiences; this inner time of consciousness occurs without the need of reflection, nor cognitive activities, somehow based on conditions of similarity or contrast (Biceaga, 2010) of the world as a set of external objects.

We cannot stop the stream of conscious experiences we have gone through; neither can we do so with the way the present experiences flow to the past. Husserl employed a metaphor when calling it a "flow," as it conveys that it has phases that are actual, elapsed, or yet to come (Husserl, 1991, p. LI): the current now, turning as soon as it is happening into a retention, while the former is also opening a protention. The temporal synthetical activity of consciousness, operates characterized by passivity, this is, independently of egoic acts. Through reflective self-consciousness we can change our focus of attention, but this is not the case for pre-reflective self-consciousness, which as I argue, it is pre-attentional in some layers, as in others it does not have any attentional activity at all. The claim is that there is a passive-temporal articulation of consciousness, and hence, of the self that integrates the corporal, affective, and temporal characteristics of the primary impressions.

The current perception of experience, the primary impression, is passive insofar the openness to the world does not involve any voluntary participation in what is being perceived, remembered, expected, or experienced. According to De Nigris (2015) the primary impression can be better characterized by two features; the first is the eidetic *association*, defined as the type of conscious activity that passively associates the current lived-experience with the framework of meaning and intelligibility provided by the intersubjective world, contributing to the pre-reflective formations of motivation for carrying out certain intentional action instead of another, already adjusted to the context. The second notion is the *central member* that involves the body, the corporal hyletics, which denotes the embodied dimension of passivity. Bodily movements form the system of constitutive layers or spheres that begins in the temporal structure of consciousness; a primary perceptual opening of conscious organisms that is a central member of the other constitutive layers or spheres (De Nigris, 2015).

The significance of the passive stratum of consciousness is perhaps most sharply revealed not by its ordinary functioning but by its disruption. Disorientation, perceptual interruption, and what Ahmed (2006) have called *queer moments,* experiences in which the habitual background of intelligibility breaks down, expose the ordinarily invisible structure of the pre-reflective horizon precisely by rendering it unavailable. When the tacit temporal synthesis that integrates retention, primary impression, and protention is interrupted, as in certain dissociative states, conditions of acute disorientation, or experimental disruptions of sensorimotor feedback, the continuity of the self becomes thematic as something lost rather than something possessed (Gallagher & Zahavi, 2012;

Husserl, 2001). These disruptions are not merely pathological curiosities but phenomenologically productive: they reveal that the passive articulation of pre-reflective self-consciousness is not a background that can be taken for granted but a constitutive achievement, one that remains in continuous operation precisely because its interruption is existentially disruptive.

In conclusion, passive syntheses take place implicitly, establishing the pre-reflective basis of consciousness and providing a tacit, pre-predicative comprehension of oneself within the intersubjective frameworks of intelligibility; they are essential to the temporal articulation of consciousness, ensuring the coherence and continuity of the flow of experiences through the (passive) integration of retentions, primary impressions, and protentions, independently of egoic acts. Moreover, the passive synthesis implies a persistent bodily pre-comprehension or conservation of both, world and self, in terms of form and regularity through the sedimentation of lived-experiences in bodily habits. Passivity, as a constitutive, multi-layered phenomenon that precedes active volition, and grounds the most basic sense of self, must be considered in the discussion about pre-reflective self-consciousness

EXISTENTIAL AFFECTIVITY

Affectivity is a fundamental dimension of experience, understood as a mode of "disclosing" the intersubjective world. Affective dispositions permeate our all experiences, as they passively accompany all our lived-experiences within the intersubjective world (Heidegger, 2000). Affections are modes of the intersubjective world of attracting or appealing to specific possibilities, rather than others, performing a pull toward us. Affection (*Affektion* or *Anstoß*) is discussed as a passive motivation, "conscious pull", or allure exerted on the ego by a pre-comprehended, object-like formation of the world (Husserl, 1950/2001/2019), such a familiar orientation or “salient” situation. The claim is that the formation of unitary connections between objects in consciousness presupposes affective force or differentiation. Moreover, some phenomenologist claim that affection is constitutive of time (Depraz, 1998), as it acts as a passive motivated involvement of the lived-experiences, and hence, provides a factual (non-formal) condition of possibility for the egoic constitutive process.

Care has been proposed to be central in understanding human life, and has its roots in ancient Greek philosophy, where it was associated with the concept of "phronesis" or practical wisdom. According to Heidegger (2000), care is the basic existential affective disposition and involves anticipation, engagement and attunement to the intersubjective structures of meaning. Unlike a specific feeling or emotional state, the existential notion of care describes it as an affective engagement with the possibilities of life and it reflects the pre-reflective disposition of the most intimate self-possibilities, based on what matters for the conscious being, in their particular horizon of the world. Instead of conceiving care as individualized concern, Heidegger (2000) used the term to refer to the fundamental

structure of the human self at an ontologically abstract level of being receptive to what might come in the future: being-ahead-of-itself, disclosed through finite temporality.

Existential affectivity captures the orientation of the self toward the possibilities of life; it is understood as a triadic relationship that encompasses anticipative affective dispositions about the own future, practical provision for oneself and significant others, and an openness to the familiar, intersubjective world. The notion of existential affectivity is not about concern, desire, or impulses, instead, it is defined as an implicit anticipative self-comprehension, where someone anticipates their possibilities within their particular worldly and bodily conditions, influenced by environmental, sociopolitical, economic circumstances of our embodied, intersubjective and finite condition (Ahmed, 2006).

Conscious beings "play" with significations, and tend to some generality in the meanings in use each time, adapting them contextually. These meanings have been given in advance both in the personal past (habits) of the conscious organisms, and in the intersubjective past of the situational environment (embodied activities, institutions, and traditions). The intentional arc, as proposed by Merleau-Ponty (2002, p. 153), is defined as the unity of the perceptive senses and the intelligence; it projects the immediate context of each conscious being around her, as well as projects the basis for her position in each experience, amid the specific physical, ideological, and moral relations she inhabits.

In this line, as part of our pre-reflective comprehension of the world, we have a way of dealing with the situations, an anticipatory implicit understanding or circumspection (*Umsich*), for which we do not see things by reflecting on them, but for which we count on them (Heidegger, 2000). As is argued in this research, our ability implicitly comprehends our continuous changing surroundings, and hence, care as the anticipatory engagement with the intersubjective world, involves a triadic structure of comprehension:

1. Pre-having (*Vorhabe*): It is an implicit familiarity with the world. This structure allows for an understanding of the world as a comprehensive whole that remains veiled, somewhat obscured, and assumed. Through this structure, we discover, appropriate, and interpret the world within the intersubjective and affective disposition that influences how this comprehensive whole is assumed to be.
2. Pre-seeing (*Vorsicht*): It is an implicit tendency to certain intersubjective meanings. Through this structure we interpret the unveiled understanding of the world, directing our attention toward a certain interpretability rather than another, toward specific meanings that emerge from our interactions with our intersubjective world.
3. Pre-understanding (*Vorgriff*): It is an implicit organization of the pre-reflective understandings within a coherent framework. Through this structure, we articulate the sense of the situation in

> such a way it is always organized, definitively or provisionally, through a particular conceptual framework, allowing for a deeper comprehension of the complexities and novelties at play in our environment.

Conscious experiences are grounded in this implicit, preverbal, yet articulated pre-reflective layer of understanding. In each conscious act, we anticipate a towards-what by inhabiting the intersubjective horizons of intelligibility with the pre-having, pre-seeing, and pre-understating structures, according to the manageability of the significantly configured framework, and, according to all the objects and persons within it. The intelligibility provided by the intersubjective world - the shared objectivity about the things in the world, is anchored in the historicity of the human community, which generates frameworks of meanings varying from position to position (Heidegger, 2000). In all the primary expressive conscious experiences there is a basic meaning operation all along: we do not experience on the one hand the signs and on the other the meanings; but when we express ourselves in our daily occupations, in each act of apprehension and expression lies an ongoing realization of ourselves. The concept of transcendental genesis is pivotal for elucidating self-consciousness, as it provides insight into how each moment of consciousness is integrated and imparts significance to subsequent moments, thus being essential for grasping the unity and continuity of the self (Zahavi, 2018).

The law of transcendental genesis refers to an internal law of consciousness (Husserl, 1986), which guides how consciousness constructs and gives meaning to experience through a temporal structural process in which each conscious experience incorporates both a trace of its own past (retention) and an opening toward its future (protention), thus establishing a significative, coherent flow that transcends the present moment (Husserl, 2008). In this line, Zahavi (2003) argues that “transcendental genesis can be viewed as a form of self-constitution in which the subject perceives the world while constituting their own sense of being” (p. 88). Furthermore, as we will argue, the common world is a “constitutive achievement” of the whole collective, open and finite, of selves (Heinämaa, 2022, p. 9). The others, the things, and the meanings of the day-to-day interactions between conscious beings shape their respective, unique selves.

Existence implies an affective projection to one’s possibilities. Phenomenologists consider our finitude as a fundamental aspect of how we exist in the world within a permanent incompleteness: the indubitable circumstance of ourselves is that our time is finite, in such a way that there is always an unfinished and pending rest to be while one is alive. Heidegger (2000) postulates that care (*Sorge*) influences how we inhabit and interpret the world: one is inherently engaged in the own temporal and intersubjective horizon, oriented toward what is yet to come, while anchoring oneself in the own pending rest to be. As argued (Heidegger, 2000), understood in this way, care is an a priori ontological generalization since it is an underlying structure of being in each case.

We have that existential affectivity is an anticipatory projection towards the possibilities within the intelligibility of the intersubjective world, integrated into the factual-affective disposition of everyday life. This points to the argument that we dispose of time to use in each existential given case, knowing for certain that someday we will not dispose of time anymore. The way time is produced while our lives last is grounded in our consciousness of finitude. Our finite condition forms our experience of time, and this finite temporality is the condition that enables existential affectivity. The openness toward the meaning of the world is inherently incomplete, as our discovering, familiarization, and comprehension of it is incomplete too, imperfect *in infinitum* (Husserl, 2001, p. 60); hence, considering how finitude shapes our sense of self, is also a question about how the condition of incompleteness shapes our sense of selves.

Affectivity refers to the disposition of looking forward, advocating ourselves towards what we care about, what is important for us, in each particular existential co-inhabiting world. In its existential conceptions, affectivity involves the continuous articulation of three conditions of an ontological nature: i. to exist, generating anticipations, being oriented towards in the middle of an intersubjective world; ii. to co-inhabit the intersubjective world through an affective disposition; and, iii. to familiarly be predisposed towards temporally, and intersubjective constituted structures of pre-comprehension, with different degrees of intelligibility. I claim that this notion of affectivity captures the existential orientation of the self toward the possibilities of its life, grounded in the consciousness of finitude and articulated through an implicit anticipatory understanding or circumspection (*Umsich*).

TEMPORALITY AND FINITUDE

We do not perceive the things as disjointed units or fragments, rather we perceive moments as "synthetically integrated" (Zahavi, 2003, p. 55): there is a self-temporalizing activity that continuously develops in a structured manner, providing the basis for time-consciousness (Husserl, 1991). Subjective consciousness of time, or as a simplified notion, (self-) temporality, is the self-consciousness of the duration of the own stream of consciousness; it is a primitive and non-temporal instance that constitutes its temporal objects, and itself, in its living unfolding (Ramirez, 2024). The way we experience time is passive, there is no active reflective acts we need to perform in our daily life so we are able to comprehend that the time is passing; in this sense, temporality is the way in which the structure of self-consciousness performs their passivity in relation to itself (Biceaga, 2010).

The internal consciousness of time is identified as the most fundamental phenomenon of the passive sphere and the basis of pre-reflective self-consciousness; moreover, some scholars have claimed that the continuous flow of lived-experiences is the absolute passivity (e.g. Biceaga, 2010). I subscribe to

the argument that temporality is linked to the consciousness of finitude, which, far from being only an existential concept, or an empirical, external fact, fundamentally shapes consciousness and self-consciousness, as well as other aspects of our cognition. In this section, the emphasis is on the consciousness of finitude in its relation with the most basic sense of self-consciousness.

Husserl, (1991) considers that there are several connected levels of time and temporality that need further description. This is the case for the proposed distinction between transcendent and immanent time. The first, refers to the "external" time of objects and events that we intend in the world, such as houses, gardens, concerts. The latter refers to the time of intending acts and contents of consciousness, the time of the act of seeing, hearing or imagining. Furthermore, there is one most fundamental level described with the notion of absolute time-constituting flow, which is proposed as a "universal condition of every intending act and intended object" (Husserl, 1991, p. XX): this flow of consciousness constitutes the immanent time of the acts and, through them, the transcendent time of external objects.

The unique, non-transferable, experience of one's own death thus serves as a profound point of life-integration and self-definition: it is only for a "me" that is possible to integrate the personal past experiences with the intersubjective current environment a "I am" is inhabiting, and with the open condition of being oriented to subsequent, coherent experiences; not in an infinite continuity, but only in finite one, delimited with and end. The law of transcendental genesis implies that each conscious experience carries within it an accumulated trace of past experiences, giving context and meaning to the present experience, while at the same time is always oriented to the immediate subsequent experience to come. The triad protention-primary impression-retention as the temporal structure of consciousness is explained by Gallagher & Zahavi (2014) such there are:

1. a 'primary impression' which may be comprehended as the elusive current moment of apprehension of a transient, intentional object, narrowly oriented toward the strictly circumscribed "now-slice" of it. It does not appear in isolation of its temporal horizon, but rather it serves as an abstract component that alone fails to convey an awareness of an intentional object.
2. a 'retention' or retentional aspect of the experience that gives us a consciousness of the immediately preceding moment of the intentional object thereby providing the primal impression with a temporal context that echoes what just occurred; it is defined by Husserl (2008) as a "tracking of the past in the present"
3. a 'protention', or projective openness that anticipates the upcoming phase of an intentional object with varying degrees of definition, providing the primary impression with a

> future-oriented temporal context. It corresponds to the implicit expectation of what is imminent to happen, in coherence with what has been happening.

The studies of Husserl about the actuality of the presence and the potentiality, virtuality, or as phenomenologists refer to, non-actuality of the possibilities, are explained by Zahavi (2012) in the following way. Since any experience always has a duration, the perceptual current experience is not punctual but it can be conceived as a perceptual field. This perceptual field, following the temporal structure of consciousness, occurs such as a continuous "now, not-now and also not-yet-now" (p. 67); hence, it is experienced within a "horizontal" or field configuration. Perceptual experience as a field has a basic unit of temporality, a duration-block, that carries out the three temporal modes (present, past, and future). The actuality of the experience (the primary association) is always surrounded by this horizon of non-actualities (retentions and protentions) (Husserl, 2008).

Retention is the primitive form of the constitution of the past, which occurs presentatively, not re-presentatively (Husserl, 2001). It is not itself an independent act, but rather a dependent moment of the triple intentionality (along with primal impression and protention), belonging to a perceptual phase or duration-block field (Zahavi, 2003). The retentional phases give consciousness the necessary temporal extension for perceiving enduring identities in the middle of succession of new apprehensions of the objects. Husserl (2001) defines retention as pure intentionality, which is the direct and immediate consciousness of the lived-experience as it elapses. Primordial impression involves the passive syntheses of fusion and contrast, based on homogeneity (similarity, uniformity) within the living present. Contrast is what marks a distinct stance in the lived-experience, when a particular datum comes into our gaze from a background within a homogeneous, familiar field. Protention is the anticipatory "pointing ahead" to the immediate future that is a structural component of every moment of consciousness, so the future is constituted in passive synthesis through protentions, which arises from motivations in the past and present, projecting a more or less prefigured horizon.

According to Merleau-Ponty (2002) the non-actual of the possibilities is not lack of presence (absence), but a passive kind of presence, one that provides contextual depth and cues to perception. As an event occurs for someone, while it is experienced, there is a unity in the temporal flow of its duration; even when each new moment of an event is different, the coherence of the whole continuity is preserved. Husserl (2008) explains that each new experience, though similar to past ones, is uniquely individual. Moreover, we have on one hand, that even when there is full equality in the succession between current experiences, their distinctiveness arises from the novelty of each moment; based on this novelty the new moment that arrives is defined integrally. And, on the other hand, we

have that during this succession and simultaneity of current and new moments, the changes and repetitions are not accidental, there is a coherent continuity, a conservation of what just happened.

The primary association of an intentional object, in its full realization in the present, occurs and then, it fades into the past while retaining its identity, gradually distancing from its particular primary association, decaying, in terms of definition. Hence, our perception is not static, but ever-changing synchronically (when events occur at the same time, simultaneously), and diachronically (when events occur in different moments in time, co-existing). Heidegger (2000) discusses temporal ecstasies, defining ecstasies as the phenomenon of going out of itself towards the situated projected possibilities. He proposes that temporality has an ecstatic-horizontal structure in which the now is not pregnant with the now-not yet, but the present springs from the future in the ecstatic unity of temporizing (Heidegger, 2000, p. 410). He argues that temporality has an ecstatic-horizontal structure, where the present is derived from the future, rather than being filled with what is to come (Heidegger, 2000, p. 410).

The horizon of experience encompasses dimensions that remain unarticulated yet are integral to our understanding of the world around us. Still, there is also, beyond this actuality, the extension of a not known yet, intersubjective, “presumptive horizon (…) of reality not properly experienced, but necessarily co-assumed” (p. 64). In fact, existential affectivity as an ontological feature explains that we anticipate and behave looking forward to our situational possibilities, in the function of something that is still pending, something that has not become real yet. Moreover, the temporal structure of our being in the world entails an essential passive incompleteness, a lack of fullness or completion: each apprehension implies the outline of some new apprehension. The continuous and varying flow of perceptions is understood as the temporality of the objects of the world that, as impressions, are synthetically retained forming an objective, coherent, temporal succession.

In the phenomenological analysis of perception, an object is never given from all its sides at once, but rather through a series of aspects or adumbrations (*Abschattung*) or appearances, (Husserl, 2001; Merleau-Ponty, 2010): at each moment, an act of perception allows us to discover a possible knowledge; the perception of an object brings its respective need for "adequation". The kinaesthetics, or bodily movements, play a role in the constitution of a stable perceptual object, as they are consciously related to the flow of appearances, prefiguring how the object will appear from different perspectives, based on the body's feeling, position and movements. According to De Nigris (2015, p. 221), in this phase of the trajectory of phenomenology, the temporality of objects is described analogously to how the experience of perceiving an object is based on the perception of adumbrations of the objects that go, throughout its perception, allowing its shapes to be outlined (De Nigris, 2015). In other words, the way of perceiving through the body and its actions is lived through adumbrations,

accompanied by an ideal of completeness or adequation, a form of understanding motivated by the glimpse of a synthesis that fulfils the meaning of the object

This temporal constitution implies two forms of adequacy, identified by De Nigris (2015). Reflection, for example, varies in a range of degrees of completeness of the evidence about the meaning of the thought object. The variation in this range of completeness depends on the level of adequacy between the intentional act and the experienced object. It also depends on the veracity of the representation of the object, in terms of clarity and distinction, from what was intentionally experienced. Consider the case when the fluid, ongoing, concordant comprehension of perception is interrupted or broken by an unexpected appearance (e.g. seeing green where red was expected).

A disappointment or interruption refers to the lived-experience of correction springs forth, and the previous belief is unvalidated, and, moreover, characterized as "void". When studying perception, phenomenology proposes the notion of retroactive crossing out, which refers to the noematic transformations that happen in the lived-experiences when a perceptual expectation is disappointed. These transformations in the intentional act radiate backward, reinterpreting the retentional (just-past) sense or meaning of the intentional object in line with new knowledge. According to De Nigris (2015), since his initial work, Husserl proposes that the essence of the experience of adequacy, as a synthetic unit, is time.

In other words, there is a type of "static" adequacy that refers to the consciousness of the identity of each and another new apprehension from the same object; as well as there is a "*dynamic*" adequacy, which describes how static adequacy is intensified through the particular dynamic relationship of each apprehension with a significance of the whole of them (De Nigris, 2015; Husserl, 2011, 2019). Here it is argued that our experience of time produces the time of the world, in the middle of which the historical dynamics of our community events are framed.

A fundamental and unresolved problem in the phenomenology of time-consciousness concerns the status of what Husserl terms the "absolute time-constituting flow", the most fundamental level of consciousness, which constitutes the immanent time of intentional acts without itself being constituted by a further, underlying act (Husserl, 1991). If this flow is the condition of possibility of all temporal experience, including the retention-impression-protention structure through which pre-reflective self-consciousness is articulated, then it cannot itself be captured by the reflective or descriptive operations that it makes possible. As Husserl acknowledges, this renders the absolute flow inaccessible to direct phenomenological thematization; any attempt to describe it arrives, by necessity, after the fact, when the flow that was to be described has already passed (Husserl, 1991; Zahavi, 2005). This is not a defect of the phenomenological method but an indication of the constitutive finitude of phenomenological inquiry itself: the absolute flow cannot be possessed, only

asymptotically approached. For the purposes of this research, this limitation is productive rather than prohibitive, it confirms that the most basic layer of pre-reflective self-consciousness is not a transparent presence but a living process that structurally exceeds the self's capacity for self-possession, and whose character as passive, finite, and constitutively non-coincident with itself is precisely what this framework seeks to account for.

Moreover, I consider that philosophical and scientific accounts on the self, in order to investigate the most basic modalities or layers of self-consciousness, need to address the question about how conscious acts are *inherently* embodied, finite and intersubjectively structured. The main claim developed so far is that passivity, existential affectivity, and temporality (inner time of consciousness) are continuously articulating pre-reflective self-consciousness, hence, these structures are involved in subjectivity, specifically, in its most basic layers.

DISCUSSION

EMPIRICAL CLAIMS

The main recurring challenge in the empirical study of consciousness is achieving semantic clarity and methodological rigor, evidenced by the lack of a consensual definition and the conflation of key terms; Nash (2024) observed a lack of a consensual definition and the conflation of terms like *awareness*, *consciousness*, *thought*, and *subjective experience*. Ranging from the proto-self in neurobiology, rooted in subcortical structures and basic emotional processes, to the minimal-self paradigm in developmental psychology, cognitive science research has studied an immediate, non-conceptual sense of self emerging through early sensory experiences, by using a variety of theoretical traditions, as well as of experimental frameworks.

Reflective self-consciousness is studied through higher-order cognitive skills like the ones emphasized by the theory of mind (ToM) and the theories on metacognition; phenomenological philosophy enriches the discussion with its conceptual foundation, arguing that consciousness is primarily expressed as tacit cogito, which is continuously oriented toward the world through bodily affective movements. Observations from developmental psychology align with the embodied, intersubjective, and temporal foundations of self-consciousness. Paradigms like the minimal self and dyadic interaction discussed that a basic sense of self is observed in early sensory experiences and social interactions, empirically aligning with the phenomenological ideas of the embodied and intersubjectively constituted self. Pre-reflective self-consciousness, understood as the ongoing sense of oneself interacting with the environment without directing explicit attention on oneself, serves to orient further empirical investigation.

The senses of agency and ownership in such early stages is discussed by the authors as key notions on explaining how a minimal self-consciousness is present long before the emergence of reflective consciousness (Fivaz-Depeursinge et al., 2004).This suggests an early form of self-consciousness, which later gives rise to the development of self-awareness as perceived by others. Thus, contrary to Piaget's view of initial indifference between self and non-self, infants exhibit a distinct self-perception from the outset, separate from their environment (Neisser, 1991). Moreover, Legrand and Ruby (2019) align with the phenomenological insight that infants possess an implicit layer of self-consciousness that allows them to differentiate between their own bodies and the external environment.

Neurodevelopmental research has observed the differentiated response of a fetus to maternal voice as an indicator of basic forms of self-awareness (Heinämaa, 2022). These responses show a capacity for a minimal or basic sensory-motor coordination that is "structured around familiarity" with the mother,

also implying an early form of pre-reflective self-recognition (Heinämaa, 2022, p. 67). Gallagher (2020) argues that this type of response does not indicate a fully developed self-consciousness, but an embodied familiarity, a "bodily attunement" (p. 34) only possible through a primary, basic layer or modality of self-consciousness.

This self-awareness emerging from dyadic interactions, is expressed in a pre-linguistic, non-representational way and is the basis for the advanced socio-cognitive skills of inference and imitation developed later in life (Ferroni & Hansson, 2021; Meltzoff & Brooks, 2020). Ciaunica (2015) has called embodied coupling to the deployment of the sensorimotor, perceptual, and affective abilities that allow the growing being, from early interactions, to be involved in a contextualized way, in the comings and goings of each day, without dealing with the situations as a mere reflective observer of the behaviour of objects and living beings of the immediate world, but as an active, always engaged part of a context of shared meaning.

Pre-reflective self-consciousness, understood as the ongoing sense of oneself interacting with the environment without directing explicit attention on oneself, serves to orient the empirical investigation. This implies the consideration of several, dynamic interactions of the cortical and subcortical regions, the central and the peripheral nervous systems, the whole body as a system with the environment, and so on. The sources collectively highlight several areas to further investigate, as well as to generate theoretical refinement. The autonomic nervous system (ANS) functions, largely outside conscious awareness, are crucial for the embodied sense of self and participate in its development through mediating infant reactions and influencing autonomic regulation shaped by early attachment. While it is easier to establish a relationship between the ANS and pre-reflective self-awareness, interoceptive signals also provide a bodily, physiological framework or context for introspective, self-reflective activities. Predictive coding models, suggesting the brain creates predictions about interoceptive states, has been investigated as a potential neural mechanism for the formation of self-consciousness too.

Concepts like the proto-self, rooted in basic sensory, motor, and affective processes in subcortical structures (*PAG, colliculi, tectum*), resonate with the idea of a primitive, automatic sense of self. According to Serino et al. (2013), both body ownership and self-location depend on multisensory integration, this is, the association of bodily signs (i.e. vestibular signals information of body in relation to gravity) in the different brain areas, and the association of these with the environmental information (i.e. visual signals of the objects in the world). A fundamental component of this processing is sensorimotor integration: according to Panksepp (2009), ownership and agency are distinct forms of this integration crucial for constituting basic self-relatedness through the link between sensory and motor stimuli. It is claimed that these underlying self-related, sensorimotor

mechanisms permit the observation of how different forms of the self are built epigenetically throughout a lifetime, shaping superior cerebral architectures.

Studies on neural networks like the DMN and CMS show activity associated with implicit self-related basic activity, not just reflective thought; according to Lou et al. (2016), the resting state activity of DMN corresponds to an implicit self-related basic activity; this implicit activity has also been considered a necessary neural predisposition of the self by Northoff et al. (2011). Moreover, the DMN is key in the generation of self-awareness, as a causal correlate of consciousness; their claim is causal, based on intervention studies, including transcranial magnetic stimulation (TMS), that by specifically targeting DMN hubs, transiently impedes different aspects of self-awareness (Lou et al., 2016). They proposed the DMN is anatomically organized around two primary cortical regions or hubs: the anterior, with the mPFC, and ACC; and the posterior, with the medial parietal, and PCC. The posterior hub has been observed as key in the retrieval of narrative self-awareness (episodic memory), while the anterior hub is instrumental in self-evaluation (introspection). By its part, PCC shows consistent activity and flexible connectivity, across multi-modal experiences, suggesting a role in maintaining internal cognitive states and facilitating environmental engagement, aligning with the idea of a baseline self-consciousness.

Northoff et al. (2011) account for conceptual, anatomical and methodological issues in the brain imaging research of the self; the authors distinguish content-based (the self is defined by specific mental, bodily, or autobiographical contents), from process-based views of the self; they claim that traditional neuroimaging, designed based on the comparison of self-specific versus non-self-specific stimuli, have often activated the CMS. Though it has been discussed that these regions lack specificity, as CMS also respond to non-self-specific stimuli, such as familiarity, or evaluation of the environment. The authors question the classical anatomical division of medial-lateral hierarchy when used in studies of self-consciousness; and, to resolve the anatomical confusion, they propose and test a threefold anatomical distinction: paralimbic, heteromodal/CMS midline, and exterosensorimotor/lateral regions; which extends the organization from subcortical to cortical zones.

They generate a meta-analysis identifying and comparing three conditions: a “self” condition, involving self-specific stimuli highly related to personal identity; a “familiarity” condition, featuring non-self-specific stimuli linked to tasks with some self-familiarity involved; and an “other” condition, which included non-specific stimuli unrelated to personal identity or familiarity. The meta-analysis results showed that the anterior paralimbic regions, specifically the perigenual anterior cingulate cortex (PACC) and the insula, are active with specificity in the “self” condition.

All conditions showed activation in posterior subcortical regions. At the cortical level, studies reveal a challenge: stimulating self-generated activities results in ambiguous activation patterns. These

networks are both extensive and specific, as activation seems to depend on the qualities of the experiences involved—such as sensory modalities, affective tones, temporal orientation, and the relationship to the environment. For example, self-related thoughts in the visual modality (imagining oneself doing something) can activate observable responses in the medial occipital cortex, while self-related activities, that are about oneself in the future, can engage prefrontal areas like the PCC and the rostrolateral prefrontal cortex. The perigenual anterior cingulate and insular cortex serve with specificity as nodes for the self, framing the model within a process-view of the self.

Based on this, Northoff (2011) claims that the self, defined as self-related processing, must be studied as a non-cognitive, affective processing that precedes self-specific contents, and underlies the relationship self-other. Methodologically, this requires moving away from the common experimental focus where the self is the independent variable (stimulus-induced activity) to a design where the brain's intrinsic resting state activity and its impact on stimuli (rest-stimulus interaction) are treated as the independent variables. This suggests the self is generated by a specific balance, or processing specificity, of internal and external stimuli (rest–intero–extero interaction) mediated by the PACC and insula, allowing for a continuous transition from self, through familiarity, to other, rather than an "all-or-nothing" dichotomy. This aligns with a phenomenological viewpoint for which the basic sense of self does not require explicit attention nor introspection but is always present in the structure of experience, as our embodied nervous system maintains a baseline level of self-consciousness.

Fox et al. (2016) have observed that in addition to the association of the vmPFC with self-related activities, the inferior parietal lobe, hormones, and biomolecules throughout the body are also involved in self-conscious experiences; furthermore, DMN activity itself is often associated with reflective processes like future planning and memory recall, accounting for reflective self-consciousness. Hence, these ambiguities makes it challenging to claim the DMN/CMS specifically correlates with pre-reflective as opposed to self-generated reflective thought; considering individual components (e.g., the insula and the anterior cingulate cortex for interoception, temporoparietal junction for self-location) has a problem in such there is a need for a more comprehensive and conceptually rigorous study of how interoceptive, proprioceptive, exteroceptive, and kinaesthetic processes are integrated across neurobiological processes.

Neurobiological methodologies, including fMRI, PET, lesion studies, and studies of neurotransmitters, hormones, and biomolecules, offer diverse avenues to investigate the substrates and modulation of self-related activities that extend beyond the nervous system, involving the peripheral nervous system and the rest of the body. Focusing on self-related processes, instead of self-referential processes, opens the door to studying the strong connection between areas and processes with significant emotional and cognitive influence to self-consciousness, as well as activities beyond the nervous system, such as neurochemical and neuroendocrine communication. Additionally, studies on

neurodevelopmental trajectories and pre-reflective self-consciousness in early childhood could keep enriching the discussion and common understanding about self-consciousness.

Mental health studies are enriched by an understanding of the autonomic basis of self-consciousness, as we consider how autonomic control problems cause fragmented self-awareness in disorders like dissociation, sadness, and anxiety. Studies on mindfulness and meditation techniques reveal that increased interoceptive awareness heightens reflective self-consciousness, illustrating the interaction between the reflective self and the most basic layers of self (Fox et al., 2021). Biofeedback and polyvagal treatment are interventions discussed as targeting vagal tone and have the potential to help patients with trauma-related disorders to regain a cohesive sense of who they are (Porges, 2018).

The neurobiological evidence reviewed in the literature posits a structured correspondence to the three-dimensional framework proposed in this research, though this correspondence must be understood as heuristic rather than reductive, as it do not resolve the explanatory gap between neural activity and phenomenal experience, but it indicates that the tripartite framework proposed here is not incompatible with neurobiological evidence, and that it may provide a conceptual structure capable of orienting future empirical inquiry (Northoff et al., 2011; Zahavi, 2005; Gallagher & Zahavi, 2012).

Regarding passivity, the continuous baseline activity of the DMN and the non-volitional interoceptive integration performed by the insular cortex and ACC represent neural correlates of the non-egoic, pre-attentional layer of self-related processing. These systems operate independently of deliberate self-monitoring, sustaining a continuous implicit orientation toward the organism's own states, a neurobiological correlate of what Husserl (2001) describes as passive synthesis. Considering existential affectivity, the affective valencing of autonomic signals through PAG-hypothalamus-insula circuits, the modulation of emotional regulation by vagal tone, and the role of interoceptive accuracy in shaping decision-making and self-evaluation together suggest that the orientation of the organism toward its own possibilities is grounded in a continuous affective-autonomic background, that precedes any explicit emotional episode. This background corresponds to what this research terms existential affectivity, the pre-reflective, anticipatory affective disposition of the organism toward its own situation. Temporality has as neurobiological correlates the continuous nature of DMN activity, the retention of contextual and autobiographical information through hippocampal-prefrontal circuits, and the predictive coding operations distributed across cortical and subcortical networks are each consistent with the phenomenological claim that pre-reflective self-consciousness is constitutively temporal, structured by a continuous integration of just-past, current, and anticipatory phases that does not require egoic intervention.

This research acknowledges several structural limitations that point toward productive directions for future inquiry. First, the precise transition from biological self-organization to phenomenally

structured self-consciousness remains unspecified. Neurobiological accounts frequently invoke subcortical structures, the PAG, the tectum, the hypothalamus as the biological forerunners of the self (Panksepp, 2007; Mizen & Hook, 2020). Yet the point at which these autonomous regulatory processes acquire the character of embodied self-consciousness, in the phenomenological sense of a *for-me* structure, remains without clear criteria. Without such criteria, the correlation between neural processes and phenomenal experience risks remaining at the level of structural analogy rather than explanatory correlation (Zahavi, 2005).

Second, the neural networks most frequently associated with self-related processing , the DMN and CMS — are not exclusive to pre-reflective baseline activity. Their activation is equally prominent in explicitly reflective processes such as autobiographical memory, future planning, and self-evaluation (Northoff et al., 2011; Fox et al., 2016). This ambiguity makes it methodologically difficult to isolate the neural correlates of pre-reflective self-consciousness from those of self-generated reflective self-consciousness, and points to the need for experimental designs capable of operationalizing this distinction rather than presupposing it. Third, while phenomenology emphasizes the unified, continuous character of embodied experience (Merleau-Ponty, 2002), neurobiological models continue to face the challenge of explaining how interoceptive, proprioceptive, exteroceptive, and kinaesthetic signals are dynamically integrated across distributed neural architectures into the singular, coherent flow of self-consciousness that lived experience presents (Gallagher, 2004). Focusing on individual network components, however well-characterized, does not yet constitute an account of this integration.

THEORICAL CLAIMS

In discussing non-linguistic representation activities as embodied interactions and iconic recognition, we observe forms of reflective self-consciousness that are not linguistically, and hence not conceptually mediated, though they involve self-recognition (Gallagher, 2020). Block et al (1997) provide a study about subjective identity and personal consciousness, about how things and sensations are felt by a person as being the same, as revealing “the same world, with the same sensible qualities and the same sensible things occupying it” (p. 73), even if they occur at different moments in time, they change influenced by our sensibility, i.e., our sleepiness or wakefulness, our hunger, our tiredness; by our age and development, and, by factors of the world, as if it is morning or night time, summer or rainy season, and so on.

Moreover, research on dissociative experiences indicates that a fundamental awareness of self persists in cases of dissociative identity disorder, observing that a basic layer of self-consciousness can remain continuous, even if fragmented or diminished (Gallagher & Zahavi, 2020). Block et al (1997) investigated the continuity of this personal consciousness, arguing that even when there may be time gaps or interruptions (for example in a case of loss of consciousness), the self is felt as being the same, per the current personal consciousness is felt as belonging along with the personal consciousness previous to the interruption, as being owned by the same person. In this line, the distinction between the conscious and unconscious components involved in the processing of language has been a significant area of investigation within the field of cognitive science. The thesis of core cognition proposes the existence of highly structured, innate representational systems, that have evolved over time, and are irreducible to sensorimotor “primitives” (Carey, 2009, p. 18, 28, 33, 75-79, 86, 108).

Studying the passive layers of lived-experiences has enriched the discussion about the most basic, primitive and non-volitional aspects of conscious organism, which integrate experiences through movements, affections, bodily rhythms and styles, habits (Heinämaa, 2022), and other “invisible” for the positivist thought phenomena (Merleau-Ponty, 2010), hard to grasp only based on the discussion within the empirical sciences. Consider the example when we watch a movie, play a video game, or read a fiction book: we are passive recipients of the words, sounds, and visuals that are shown to us. Though we did decide, voluntarily, to watch, play or read, we do not decide how affected we would be with these images, words, and sounds; we may be affected and influenced by them in how we feel and understand the world. At the same time, this experience is also passively influenced by how we are (ourselves) and how we comprehend the world, based on how we have lived, our past experiences.

Historically, the study of the self within philosophy of mind has frequently been characterized by certain enduring misconceptions, particularly those rooted in an inherited Cartesian understanding (Heinämaa, 2022). The traditional, critical view often assumes that the transcendental self proposed by Husserl is a version of Kant's ego cogito, conceived as a universal, a-temporal, and non-changing formal factor that uniformly accompanies all representations; this led to the misinterpretation that the self is a creator of objectivity and meaning (Heinamaa, 2022). Phenomenologists consider this as a dualistic framework where the self is different and opposed to the body, the world, and whatever remains alien, or unfamiliar, to it. Husserl (1950) explicitly critiques the atomistic interpretations of empiricism that aim to extract sensory experiences as isolated entities, as the claim is that consciousness is inherently synthetic, with passivity demonstrating various modes of synthesis.

According to Merleau-Ponty (2002) the empirical reductionism substitutes "a special set-up" of the experience, rather than studying the original phenomenon. Limitations of reflective perspectives and

representational theories of consciousness have been centered around their understanding of the role of embodiment in cognition along computational lines only (Kiverstain 2012). Behavior is shaped, or "obscured" by reflex responses and the intricate organization of stimuli within the continuous stream of lived-experiences, in such a way, "the 'sensible' cannot be defined as the immediate effect of an external stimulus" (Merleau-Ponty ,2002, p.8). In this line, phenomenology questions the reductive inclinations of traditional analytical philosophy of mind, or as Heinämaa, (2013) posits, reductionists, such as materialist monists and computationalists, run the risk of overlooking the fundamental aspect of phenomenology. By its part, the distinction between transcendental or ontological inquiries and empirical investigations demand to be further investigated (Heinama and Rodemeyer, 2010).

Comprehended as a "perceptual logic of the aesthetic world" (Merleau-Ponty, 2000), the studies on the pre-reflective layer consider how fundamental intersubjectivity is for the experience of subjectivity: the claim is that perception is not the origin of this primary logical structure, as it is the means by which it is realized by our subjectivity, and then specified by our subjective cognitive acts. As Heinamaa (2007, p. 321) explains, "all the activity constitutive of a personal self has a passive basis in the stream of lived experiences". Consequently, consciousness cannot be reduced into quantifiable, discrete elements such as sensory data or isolated neural activations; the self is not primarily a cognitive agent, disconnected from historical, cultural, and embodied influences. Furthermore, empiricism and naturalism are criticized by phenomenologists for attempting to reduce ideality (such as logical laws or meaning) to reality (psychic acts or causal processes), as they argue, this attempt is a self-refuting scepticism that undermines the very possibility of any theory (Husserl, 1950/1962; Zahavi, 2003). By its part, phenomenology focuses on the structure of consciousness and its correlates, while omitting the interrogation about the reality of the object of consciousness.

Phenomenologist do not claim that the activity and passivity of consciousness, and self-consciousness are strictly different modalities; Husserlian research emphasizes the primordial dimensions of experience and the genesis of judgment, through a genetic method that migrates from active to passive forms of constitution, distinguishing them in terms of degree, rather than in terms of kind or type (Husserl, 2001). Perception, as openness to the intersubjective world, is passively structured as a unified whole; yet the passive temporal structure interacts with the active reflective dimensions of consciousness, in a migration that requires further research. Merleau-Ponty (2010) proposes the notion of promiscuity as the point in which activity and passivity are equal, e.g. the passivity of being affected by oneself (in the inner consciousness of time), or the motivational impulse that introduces otherness and meaning to the self before any spontaneous act (primary affectivity). Moreover, the author claims that there is a chiasm, a reversibility and intertwining, between activity and passivity that makes their distinction ultimately structural rather than ontological.

Hence, as Heinämaa (2022) explains, the self is not a *solus ipse* (solitary agent), but operates within transcendental intersubjectivity, which is the constitutive basis for the objective sense of the world; explained by the intentionality of consciousness, we are inherently oriented to our environment: we constantly, and most of the times tacitly, reference our past and future immediate possibilities for the current experience "at hand". A phenomenological claim is that, as each conscious experience is characterized by a passive self-presence and immediacy, it involves a self-affectivity that does not use explicit reflection (Zahavi, 2005). The recognition of other living beings as sensing subjects, whether human or animal, does not proceed primarily through inference or analogical reasoning but through a passive associative synthesis grounded in bodily similarity (Heinämaa, 2014). Perceiving movements in another organism that are structurally analogous to one's own passively activates the same bodily-affective schemas through which one understands one's own sensorimotor life, thereby transferring to the other the sense of being a living, sensing subject (Heinämaa, 2014). This process of empathetic transfer, operating below the threshold of deliberate judgment, constitutes one of the earliest and most fundamental forms of intersubjective recognition, and it presupposes precisely the kind of pre-reflective, passively constituted bodily self-awareness that this research has argued to be foundational to all conscious experience.

Through intersubjectivity we come to the realization of ourselves, as there are no perceptions without an environment, detached and uncommunicated from the other perceptions we have experienced before, and, from the history of perceptions and understanding of others, within the common world of culture. For example, consider the case when something that happens makes us happy, we are not creating the emotion, but rather the world is present to us as an affective existential whole, in this case, with the patterns, characteristics, tonalities and rhythms of happiness. Moreover, if as a response, we start to sing some melody without noticing it, there is a degree of passivity there too, as this gesture may involve a really weak involvement of any active self-related cognition, but a strong affective world-experience, directly influencing our actions and feelings, and in general, who we are in any given moment. For Husserl, intentionality is a "co-operative dynamic" structure or a "constitutive duo" (Husserl, 2001), as both sides of the intentional correlation, the self-givenness (noesis), and the given object (noema), are operative.

Temporality is a crucial complex case of intentional analysis: as consciousness is always consciousness of something, time and the consciousness of time "enter into" every lived-experience, even those seemingly unrelated to time, such as judgment or desire. Our conscious life is intrinsically temporal: it extends between beginning and end, so we have a finite duration, and we experience the growing and aging of ourselves, through time; also of the people and living organisms around us. Furthermore, our finite condition forms our affectivity: being a self is, by definition, being in an aperture to the cease of being, the own death; it is our possibility of not having more time, of not

being there anymore that articulates existentially being inherently in an affective disposition oriented ahead of oneself, to one's own projects, already inhabiting a current given pre-comprehended background. The temporality of consciousness influences epistemological achievements, and attitudes, our comprehension of the world is intrinsically incomplete, or unfinished; while new adumbrations, profiles, angles, and perspectives both of the discovered, and undiscovered things appear to us modifying or validating what we previously feel, think, and so on, at the same time we are getting old and forgetting more than what is remembered.

For Husserl, the full sense of the world is not achieved by a solitary ego but by a transcendental community of selves whose co-constitutive activity grounds the shared objectivity of experience (Husserl, 2001; Heinämaa, 2022). In this line, the intersubjective horizon is not an optional supplement to self-consciousness but its condition of possibility: the world is always already a common world, and the self is always already constituted in relation to others. Moreover, the intersubjective constitution of self-consciousness has been extended and challenged by contemporary critical phenomenological perspectives that foreground the social and political situatedness of the lived body, and the pre-reflective background.

Ahmed (2006) argues that the body's habitual orientation toward the world, what phenomenology describes as the sedimented horizon of passivity, is not a neutral formal temporal structure but is differentially shaped by social and political limits and habits, that determine which possibilities are reachable and which are not. Race, gender, labor, and privilege are sedimented into the pre-reflective orientation of the body, conditioning the affective and practical intelligibility of the surroundings before any reflective awareness (Ahmed, 2006). By treating passivity primarily as a formal transcendental structure, this research risks abstracting from the material and historical conditions that differentiate the pre-reflective horizons of different situated subjects.

But passivity is not a formal structure, but an embodied, intersubjective ontological condition, and it grounds the continuity of temporality. I agree with the argument of Ahmed, in that the temporal horizon is politically charged, as within it, the reach of a body's possibilities is pre-determined by histories they did not choose, but precisely, this incapacity of controlling vital aspects of owns life, as the access to water or food, is part of the passive condition, the fragility of the conscious experience, as studied by phenomenology. In this line, accounting for these variables is not only a political demand but a cognitive-scientific one: an adequate account of cognition necessitates to attend to the specific histories of vulnerability, specially, when more and more people are living within some grade or oppression in our societies. This challenge does not refute the phenomenological framework but demands its extension: an adequate account of pre-reflective self-consciousness must be capable of

accounting for the differential sedimentation of social and political histories into the very passivity it seeks to describe (Ahmed, 2006; Heinämaa, 2022).

CONCLUSION

This research has argued that pre-reflective self-consciousness is not a static phenomenon but a co-constituted structure articulated by three mutually implicated dimensions: passivity, existential affectivity, and finite temporality. Conscious experience is fundamentally self-present and immediate, hence, subjectivity is a fundamental phenomenon for the study of consciousness and self-consciousness and it needs to be further explored both theoretically and empirically; from the phenomenological and interdisciplinary discussion.

Departing from phenomenology, there is a robust claim that self-consciousness does not necessarily involve a higher-order cognitive activity of reference to the self, rather the basic sense of self, along with the other modalities or layers of self-consciousness, which is a fundamental part of how our ongoing self-conscious experiences are structured. By analysing temporality as time-consciousness, this work describes the self as a continuously becoming phenomenon -anchored in its past, engaging with the present, and oriented toward the future, toward the pending experiences, projects, and goals yet to complete.

Within developmental psychology, paradigms like the minimal self, dyadic interaction, and multimodal coordination reveal how a basic sense of self is observed through early sensory experiences and social interactions. Studies show infants' ability to distinguish self/other touch, respond to maternal voice, and develop a sense of agency and ownership through sensorimotor tasks. Dyadic interactions, characterized by mutual responsiveness, emotional attunement, and early coordination (like shared gaze and synchronised gestures), demonstrate the pre-verbal basis of the self-with-another and provide insights into how a distinct self-awareness emerges in relation to others. Multimodal coordination studies further illustrate how sensory modalities are integrated in basic social dynamics, moving beyond mere imitation to anticipation and adaptation to others' intentions. These developmental observations empirically ground the phenomenological ideas of the embodied, intersubjective, and temporally structured self.

While current empirical research on self-consciousness faces challenges, certain findings align with the notion of basic sense of self: insights support the dynamic interplay between neural activity, bodily states, and the environment. The integration of neurobiological processes related with the self needs further exploration in order to account for the neurobiological foundations of self-consciousness; studying a basic modality of self-consciousness does not correlate solely on subcortical regions.

Phenomenology provides a theoretical framework that enables cognitive science to investigate lived experiences beyond the realm of explicit cognition and introspective analysis. Following the methodological reductions, it is observed that conscious experiences, as they are intentional acts, are

always projected with a horizon of indeterminacy, or incompleteness. The world we cohabit with others, we are open and oriented to, is a lived experience of continuous presence, or presentation that we are both, passively familiarizing with, and actively trying to understand, according to each subjective perspective. Pre-reflective self-consciousness involves a bodily sedimentation that not only influences, rather articulates how we engage with the world, with the different degrees of validity in our assumptions, and tacit comprehension. Furthermore, the temporal constitution of consciousness, and hence, self-consciousness is passive. The coherent continuum of lived experiences, not in all its explicit narratives, but, in a pre-reflective manner, of an "I"; all of "what I have been through in my life" for someone, "what I have lived so far". The unity of the lived-experiences takes the basis in the passive (embodied, and temporal) integration.

The temporal structure of consciousness is articulated by the triad of primary impression (current now-slice), retention (consciousness of the immediately preceding moment), and protention (anticipation of the upcoming phase); this pre-reflective structure generates a perceptual field that functions as a duration-block that carries the three temporal modes, and is always surrounded by a horizon of non-actualities. The continuous and varying flow of perceptions is understood as the temporality of the objects of the world that, as impressions, are synthetically retained forming an objective, coherent, temporal succession. Critically, the temporal structure of our being entails an essential passive incompleteness, and this finite temporality is the condition that enables existential affectivity.

The pre-reflective self-consciousness, which operates beneath explicit cognitive processing, is maintained by passivity: the basic layer of self is constantly structuring our lived-experience and being affected by each integration of intentional, temporal aspects of them. Our continuous involvement with the world necessitates a passive integration of lived experiences without us having to decide how to initiate or control it; in this way, the contents can be coherently associated, and there is pre-comprehensive conservation of the world as the horizon of possible intentional acts, based on the past self-experiences. Pre-reflective self-consciousness is inseparably co-structured by passivity, the internal awareness of time, and affectivity. In this research, I propose that existential affectivity, passivity, and finitude, as providing the fundamental orientation for the body's movement and spatiality within the intersubjective world, have a role in the articulation of pre-reflective self-consciousness.

CORPUS

The following works constitute the primary philosophical corpus from which the conceptual analysis proceeds.

Ahmed, S. (2006). *Queer phenomenology: Orientations, objects, others*. Duke University Press.

Biceaga, V. (2010). The Concept of Passivity in Husserl's Phenomenology (Contributions to Phenomenology, Vol. 60). Springer.

Heidegger, M. (2000). El Ser y El Tiempo. *Tübingen: Max Niemayer Verlag*. mln.1998.0037

Heinämaa, S. (2007). Selfhood, consciousness, and embodiment: A Husserlian approach. En *The Problem of Embodiment: A Collection of Essays* (pp. 312–330).

Heinämaa, S. (2019). *Phenomenology and embodiment: Husserl and the constitution of self*. Northwestern University Press.

Heinämaa, S. (2022). Self: Temporality, Finitude and Intersubjectivity. In *Empathy, Intersubjectivity, and the Social World* (pp. 187–200). De Gruyter.

Husserl, E. (1962). *Ideas relativas a una fenomenología pura y una filosofía fenomenológica* (J. Gaos, Trad.). Fondo de Cultura Económica. (Obra original publicada en 1913)

Husserl, E. (2001). Analyses Concerning Passive and Active Synthesis: Lectures on Transcendental Logic (A. J. Steinbock, Trans.). Kluwer Academic Publishers. [Extracts from Analysen zur passiven Synthesis (Hua XI), Aktive Synthesen (Hua XXXI), and from Zur Phänomenologie der Intersubjektivität (Hua XIV)].

Husserl, E. (2005). Meditaciones cartesianas. (J. Gaos & M. García-Baró, Trads.). Fondo de Cultura Económica (70th Anniversary Commemorative Edition).

Husserl, E. (2008). *Lecciones de fenomenología de la conciencia interna del tiempo.* (A. Serrano de Haro, Trans.). Editorial Trotta.

Merleau-Ponty, M. (1969). *The Visible and the Invisible: Philosophical Interrogation* (A. Lingis, Trans.). Northwestern University Press.

Merleau-Ponty, M. (2002). *Phenomenology of Perception.* Routledge. ISBN 0-203-99461-2

Zahavi, D. (2005). *Subjectivity and selfhood: Investigating the first-person perspective*. MIT Press.

REFERENCES

Adler, D., Herbelin, B., Similowski, T., & Blanke, O. (2014). Breathing and sense of self: Visuo–respiratory conflicts alter body self-consciousness. *Respiratory Physiology & Neurobiology*, 203, 68–74.

Allis, C. D., Jenuwein, T., & Reinberg, D. (2007). *Epigenetics*. Cold Spring Harbor Laboratory Press.

Apperly, I. A., & Butterfill, S. A. (2021). *The development of theory of mind in early childhood. Annual Review of Psychology*, 72, 627-651.

Astington, J. W. (1993). The child's discovery of the mind. Harvard University Press.

Banks, W., & Farber, I. (2003). Consciousness. Weine, A. Healy, & R. Proctor (Edits.), Handbook of psychology (Vol. 4. Experimental psychology, p. 3-32). New Jersey: J. W. Sons.

Barrett, L. F. (2017a). The theory of constructed emotion: An active inference account of interoception and categorization. *Social Cognitive and Affective Neuroscience*.

Barrett, L. F. (2017b). *How emotions are made: The secret life of the brain*. Houghton Mifflin Harcourt.

Barrett, L. F., & Simmons, W. K. (2019). *Interoceptive predictions in the brain*. Nature Reviews Neuroscience, 16(7), 419-429.

Beith, D. (2012). Passivity in the philosophy of Merleau-Ponty. [Inedit Doctoral Dissertation].

Beckmann, C. F., DeLuca, M., Devlin, J. T., & Smith, S. M. (2005). Investigations into resting-state connectivity using independent component analysis. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*(1457), 1001. https://doi.org/10.1098/rstb.2005.1634

Bello, A. A., Antonelli, M., Backhaus, G., Balaban, O., Baptist, G., Bengtsson, J., Benoist, J., Bernasconi, R., Bielawka, M., Bosio, G., Bourgeois, P., Buceniece, E., Callieri, B., Cantista, M. J.,

Blanke, O., & Metzinger, T. (2019). *Full-body illusions and minimal phenomenal selfhood*. Trends in Cognitive Sciences, 23(10), 804-812

Block, N. (1995). On a confusion about a function of consciousness. *Behavioral and Brain Sciences, 18*(2), 227–247.

Block, N. ; Flanagan, O., Guzeldere, G. (eds.) (1997). The Nature of Consciousness: Philosophical Debates. MIT Press.

Bortolan, A. (2019). Affectivity and the distinction between minimal and narrative self. Phenomenology and the Cognitive Sciences, 18(4), 793–812.

Brennan, T. (2004). *The Transmission of Affect*. Cornell University Press.

Canán, A. C., Cecilia, M. A., Conill, J., Cousin, F. R., D'Ippolito, B. M., … Staudigl, M. (2002). Passivity as Pre-Predicative Constitution in Husserl: Structure and Discussion. En *Phenomenology World-Wide* (pp. 119–133). 978-94-007-0473-2_12

Candia-Rivera, D., & Machado, C. (2023). Multidimensional assessment of heartbeat-evoked responses in disorders of consciousness. European Journal of Neuroscience, 58(4), 3098–3110. https://doi.org/10.1111/ejn.16079

Cappuccio, M., & Froese, T. (Eds.). (2022). Enactive Cognition at the Edge of Sense-Making: Making Sense of Non-Sense. Palgrave Macmillan.

Carey, S. (2009). The origin of concepts. Oxford University Press

Casper, M.-O., & Artese, G. F. (Eds.). (2023). Situated Cognition Research: Methodological Foundations. Springer.

Ciaunica, A. (w.y.). Basic forms of pre-reflective self-consciousness: A developmental perspective. In D. Zahavi (Ed.), The Oxford Handbook of the Philosophy of Consciousness. (Chapter 18)

Clark, A. (2008). Supersizing the Mind: Embodiment, Action, and Cognitive Extension. Oxford University Press.

Craig, A. D. (Bud). (2018). How do you feel? Interoception: The sense of the physiological condition of the body. *Nature Reviews Neuroscience*, 3(8).

Critchley, H. D., Garfinkel, S. N., & Nagai, Y. (2013). Functional integration of brain and body in self-regulation. *Neuropsychologia, 51*(6), 913–918.

Critchley, H. D., Harrison, N. A., & Garfinkel, S. N. (2020). Interoception and the autonomic nervous system. *Nature Reviews Neuroscience, 21*(8), 488–503.

Crone, K., & Huemer, W. (2018). Self-consciousness and intersubjectivity: dimensions of the social self. En *Phenomenology and the Cognitive Sciences*. s11097-017-9547-6

Damasio, A. R. (1999). The feeling of what happens: Body and emotion in the making of consciousness. Harcourt Brace.

Damasio, A., & Carvalho, G. B. (2013). The nature of feelings: Evolutionary and neurobiological origins. *Nature Reviews Neuroscience, 14*(2), 143-152.

Dary, Z., & Lopez, C. (2023). Understanding the neural bases of bodily self-consciousness: Recent achievements and main challenges. Frontiers in Integrative Neuroscience, 17, Article 1145924. https://doi.org/10.3389/fnint.2023.1145924

Dennett, D. C. (1991). *Consciousness explained*. Little, Brown.

De Nigris, F. (2015). Intencionalidad, pasividad y autoconciencia en la fenomenología de Husserl. *Ideas y Valores*, 64(157), 215–250. Ideasyvalores.v64n157.41594

Depraz, N. (1998). Imagination and passivity in Husserl and Kant: A cross-relationship. En N. Depraz & D. Zahavi (Eds.), *Alterity and Facticity* (pp. 29–56). Kluwer Academic Publishers.

Depraz, N., Varela, F. J., & Vermersch, P. (2002). On Becoming Aware: An Experiential Pragmatics. Benjamins Press.

De Vignemont, F., & Alsmith, A. (2017). The Subject's Matter: Self-Consciousness and the Body. The MIT Press.

Di Bernardo, M. (2022). Neurophenomenology and Intersubjectivity: An Interdisciplinary Approach. *Axiomathes*, 32(Suppl 2), S95–S111. https://doi.org/10.1007/s10516-021-09590-3

Di Paolo, E., Rohde, M., & De Jaegher, H. (2010). The enactive approach: Theoretical sketches from cell to society. *Pragmatics & Cognition, 18*(1), 1-36.

Dreyfus, H. (1992). *What Computers Still Can't Do: A Critique of Artificial Reason*. MIT Press.

Eddy, C. M. (2022). Transdiagnostic relevance of self-other distinction to psychiatry. Frontiers in Psychiatry. https://doi.org/10.3389/fpsyt.2022.797952

Fardo, F., Auksztulewicz, R., & Allen, M. (2020). Neuronal signatures of interoceptive awareness. *Cerebral Cortex, 30*(2), 517–530.

Farmer, H., Ciaunica, A., & Hamilton, A. F. (2018). The functions of imitative behaviour in humans. *Mind & Language*, 33(1), 1–17.

Feinberg, T. E. (2011). The nested neural hierarchy and the self. *Consciousness and Cognition*, 20, 4–15. https://doi.org/10.1016/j.concog.2010.09.016

Feldman, R. (2019). The neurobiology of human attachments. *Trends in Cognitive Sciences, 23*(10), 801–816.

Ferroni, F., & Hansson, H. (2021). Developmental trajectories of self-awareness in infancy: The role of sensorimotor and social experiences. *Infant Behavior and Development*, 64, Article 101603.

Fox, K. C. R., Dixon, M. L., & Christoff, K. (2021). Neural mechanisms of mindfulness and meditation. *Annual Review of Neuroscience, 44*, 287–311.

Frank, M. (2015). Prä Reflexives Selbstbewusstsein: Vier Vorlesungen. Philipp Reclam jun. GmbH & Co. KG.

Gallagher, S. (2004). *How the body shapes the mind*. Oxford University Press.

Gallagher, S. (2020). *Action and Interaction*. Oxford University Press.

Gallagher, S. (2022). *Embodied, Embedded, Enactive, and Extended Cognition: Philosophical Foundations of the Sciences of Mind*. Cambridge University Press.

Gallagher, S., & Zahavi, D. (2008). *The Phenomenological Mind*. Routledge.

Gallagher, S., & Zahavi, D. (2014). Primal impression and enactive perception. *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality*, 83–100. mitpress/8516.003.0010

Garbarino. (2001). El fenómeno de la afectividad en Husserl.

Gendlin, E. (1997). *Experiencing and the Creation of Meaning: A Philosophical and Psychological Approach to the Subjective*. Northwestern University Press.

Gibson, J. J. (2014). The Ecological Approach to Visual Perception. In *The Ecological Approach to Visual Perception*. 9781315740218

Glasgow, R. D. V. (2018). Minimal Selfhood and the Origins of Consciousness. Würzburg University Press.

Goldstein, K. (1923). *Über die Abhängigkeit der Bewegungen von optischen Vorgängen*. *54*(No. 1), 141-153.

Goupil, L., Johansson, P., Hall, L., & Aucouturier, J.-J. (2019). Influence of vocal feedback on emotions provides causal evidence for the self-perception theory. *BioRxiv*. https://doi.org/10.1101/510867

Heinämaa, S. (2013). Merleau-Ponty: A Phenomenological Philosophy of Mind and Body.

Heinämaa, S. (2014). Transformations of Old Age: Selfhood, Normativity, and Time.

Heinämaa, S. (2017). On the Complexity and Wholeness of Human Beings: Husserlian Perspectives. *International Journal of Philosophical Studies*, 25(3), 393–406.

Heinämaa, S., & Rodemeyer, L. (2010). Introduction. Cont Philos Rev. 43:1–11 DOI 10.1007/s11007-010-9130-0

Heinämaa, S., Mäkinen, V., & Tuominen, M. (Eds.). (2014). The Animal and the Infant: From Embodiment and Empathy to Generativity. In *Phenomenological Perspectives to Aristotelianism and Its Critics*. Brill.

Henry, M. (2008). *Material phenomenology* (S. Davidson, Trans.). Fordham University Press.

Husserl, E. (1950). Ideas relativas a una fenomenología pura y una filosofía fenomenológica, Libros II y III. (W. Biemel, Ed. del original alemán). Fondo de Cultura Económica.

Husserl, E. (1991). On the phenomenology of the consciousness of internal time (1893-1917). Springer.

Husserl, E. (2000). Ideas relativas a una fenomenología pura y una filosofía fenomenológica, Libro Tercero: La fenomenología y los fundamentos de las ciencias. (L. E. González, Trad.; A. Zirión Q., Rev.). Universidad Nacional Autónoma de México, Instituto de Investigaciones Filosóficas.

Kiverstein, J. (2007). Consciousness, the minimal self, and brain. *Synthesis Philosophica*, 22(2).

Kiverstein, J. (2012). The Meaning of Embodiment. *Topics in Cognitive Science,* 1(19). DOI: 10.1111/j.1756-8765.2012.01219.x

Laborde, S., Mosley, E., & Thayer, J. F. (2018). Heart rate variability and self-regulation. *Frontiers in Psychology, 9*, 843.

Lane, T., Duncan, N. W., Cheng, T., & Northoff, G. (2016). The trajectory of self. *Trends in Cognitive Sciences*, 20(5), 318-319.

Leech, R., & Sharp, D. J. (2013). The role of the posterior cingulate cortex in cognition and disease. *Brain*, *137*(1), 12. https://doi.org/10.1093/brain/awt162

Legrand, D. (2005). The bodily self: The sensory-motor roots of pre-reflective self-consciousness. *Phenomenology and the Cognitive Sciences*, 89-118.

Legrand, D. (2011). Phenomenological Dimensions of Bodily Self-Consciousness. In *The Oxford Handbook of the Self* (pp. 204–227). https://doi.org/10.1093/oxfordhb/9780199548019.003.0009

Legrand, D., & Ruby, P. (2019). Agency and the minimal self. *Consciousness and Cognition*, 68, 63-75.

Lennertz, R., Pryor, K., Raz, A., & others. (2023). Connected consciousness after tracheal intubation in young adults. *British Journal of Anaesthesia*, 130(2), e217–e224. https://doi.org/10.1016/j.bja.2022.04.010

Li, W., Li, G., Ji, B., Zhang, Q., & Qiu, J. (2019). Neuroanatomical Correlates of Creativity: Evidence From Voxel-Based Morphometry. *Frontiers in Psychology*, 10, Article 155. https://doi.org/10.3389/fpsyg.2019.00155

Lotz, C. (2007). From affectivity to subjectivity: Husserl and affective intentionality. Palgrave Macmillan

Lugones, M. (1987). Playfulness, "World"-Traveling, and Loving Perception. *Hypatia, 2*(2), 3-19.

Kokkinaki, T., et al. (2016). Coordination of Emotions in Mother–Infant Dialogues. *Infant and Child Development*, 25(2), 177-190.

Maier, M. E., & Hare, T. A. (2019). The influence of interoceptive awareness on emotional regulation. *Social Cognitive and Affective Neuroscience, 14*(7), 669–679.

Meltzoff, A. N. (1988). Infant imitation and memory: nine-month-olds in immediate and deferred tests. *Child development*. j.1467-8624.1988.tb03210.x

Meltzoff, A. N., & Brooks, R. (2020). Like me as a foundation for social cognition: The implications of imitation and memory on the development of self-awareness*. Philosophical Transactions of the Royal Society B: Biological Sciences*, 375(1797), 20190448.

Merleau-Ponty, M. (2010). Lo visible y lo invisible. (A. M. Gómez, Trad.). Nueva Visión, Buenos Aires.

Mesulam, M. M. (1998). From Sensation to Cognition. *Brain, 121*(6), 1013-1052.

Metzinger, T. (2003). *Being no one: The self-model theory of subjectivity*. MIT Press.

Mizen, C. S., & Hook, J. (2020). Relational and affective neuroscience a quiet revolution in psychiatric and psychotherapeutic practice. *British Journal of Anaesthesia.* https://doi.org/10.1192/bja.2020.63

Montirosso, R., & McGlone, F. P. (2020). The body comes first: Embodied re-afference and the origins of self-consciousness. *Developmental Cognitive Neuroscience*, 45, 100817.

Müller, C., Cienki, A., Fricke, E., Ladewig, S. H., McNeill, D., & Bressem, J. (Eds.). (2014). *Body Language Communication: An International Handbook on Multimodality in Human Interaction*. De Gruyter.

Nash, J. (2024). The Study of Consciousness Is Mired in Complexities and Difficulties: Can They Be Resolved? *Qeios*.

Neisser, U. (1988). Five Kinds of Self-knowledge. *Philosophical Psychology*. 09515088808572924

Newen, A., De Bruin, L., & Gallagher, S. (Eds.). (2020). *The Oxford Handbook of 4E Cognition*. Oxford University Press.

Noë, A. (2009). *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness*. Hill and Wang.

Northoff, G., Qin, P., & Feinberg, T. (2011). Brain imaging of the self: Conceptual, anatomical, and methodological issues. *Consciousness and Cognition*, 20, 53-63.

Northoff, G., & Huang, Z. (2017). How do the brain's time and space mediate consciousness and its different dimensions? *Neuroscience & Biobehavioral Reviews*, 80, 630-645.4

Oswald, P. M. (2014). El concepto de pasividad en Edmund Husserl.

Pacholik-Żuromska, A., & Preyer, G. (2022). Shaping Pre-Reflective Self-Consciousness. *Journal of Artificial Intelligence and Consciousness*, 9(4). DOI: 10.1142/S2705078522500175

Panksepp, J. (2007). The neuroevolutionary and neuroaffective psychobiology of the prosocial brain. In R. I. (Ed.), *The Oxford handbook of evolutionary psychology* (pp. 145-162). Oxford, UK: Oxford University Press.

Panksepp, J & Panksepp, J.B. (2000). The seven sins of evolutionary psychology. *Evolution and Cognition*, 6(2), 108-138.

Papoušek, M. (2007). Communication in early infancy: An arena of intersubjective learning. *Infant Behavior and Development*. https://doi.org/10.1016/j.infbeh.2007.02.003

Park, H. D., Correia, S., & Tallon-Baudry, C. (2018). The neural basis of heartbeat perception. *Journal of Neuroscience, 38*(31), 6583–6593.

Parvizi, J., Van Hoesen, G. W., Buckwalter, J., & Damasio, A. (2006). Neural connections of the posteromedial cortex in the macaque. Proceedings of the National Academy of Sciences, 103(5), 1563-1568. Doi: 10.1073/pnas.0507729103

Pepperell, R. (2018). Consciousness as a physical process caused by the organization of energy in the brain. Frontiers in Psychology, 9, Article 2091. https://doi.org/10.3389/fpsyg.2018.02091

Pintos Peñaranda, M. L., & González López, J. L. (Eds.). (1998). Fenomenología y Ciencias Humanas (Congress). Servicio de Publicación e Intercambio Científico, Universidad de Santiago de Compostela.

Place, U. T. (1956). Is consciousness a brain process? *British Journal of Psychology*, 47(1), 44–50. https://doi.org/10.1111/j.2044-8295.1956.tb00560.x

Polák, M., & Marvan, T. (2018). Neural Correlates of Consciousness Meet the Theory of Identity. *Frontiers in Psychology*, 9, Article 1269. https://doi.org/10.3389/fpsyg.2018.01269

Porges, S. W. (2018). Polyvagal theory: Vagal pathways and self-regulation. *Dialogues in Clinical Neuroscience, 20*(1), 16–29.

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1*(4), 515–526.

Quadrelli, E., & Turati, C. (2016). Mirroring: A neuroconstructivist framework. *British Journal of Developmental Psychology*, 34(1), 1–25.

Raichle, M. E., MacLeod, A. M., Snyder, A. Z., Powers, W. J., Gusnard, D. A., & Shulman, G. L. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences, 98*(2), 624-629. Doi: 10.1073/pnas.98.2.624

Ramírez, M. (2024). El concepto de tiempo más originario en Husserl: La atemporalidad del presente viviente. doi.org/10.18800/estudiosdefilosofia.202401.011

Reddy, V., Markova, G., & Wallot, S. (2020). Early social interactions and the sense of self. *Child Development Perspectives*, 14(1), 30-35

Reich, W. (1989). History of the notion of care. Retrieved from https://theology.georgetown.edu/research/historyofcare/classicarticle

Rochat, P. (2003). Five levels of self-awareness as they unfold early in life. *Consciousness and Cognition*, 12(4), 717–731.

Rochat, P., & Zahavi, D. (2011). The uncanny mirror: A re-framing of mirror self-experience. *Consciousness and Cognition*, *20*(2), 204–213. j.concog.2010.06.007

Rochat, P., Broesch, T., & Jayne, K. (2020). Self-awareness in children across cultures. *Developmental Psychology*, 56(4), 768–783.

Rosenthal, D. M. (1993). State consciousness and transitive consciousness. *Consciousness and Cognition*, 2(4), 355–363.

Sattin, D., Magnoni, S., Citerio, G., & others. (2021). Theoretical models of consciousness: a scoping review. *Brain Sciences*, 11, Article 535. https://doi.org/10.3390/brainsci11040535

Schneider, F., Bermpohl, F., Heinzel, A., Rotte, M., Walter, M., Tempelmann, C., Schürmann, M., Göritz, A. S., Dobrowolny, H., Bogerts, C., Panksepp, J., & Northoff, G. (2008). The resting brain and our self: Self-relatedness modulates resting state neural activity in cortical midline structures. *Neuroscience*, 157(1), 120–131. https://doi.org/10.1016/j.neuroscience.2008.08.014

Seeley, W. W. (2010). Anterior insula degeneration in frontotemporal dementia. Brain Structure and Function, 214, 465–475. https://doi.org/10.1007/s00429-010-0254-0

Searle, J. R. (1995, December). The Mystery of Consciousness: an exchange with Daniel C. Dennett. The New York Review of Books. Searle, J. (1997). The Mystery of Consciousness. New York Review Books.

Searle, J. (1997). The Mystery of Consciousness. En *New York Review Books*.

Seth, A. K., & Bayne, T. (2021). Theories of consciousness. Nature Reviews Neuroscience. https://doi.org/10.1038/s41583-022-00587-4

Smith, J. (2017). Self-Consciousness. Stanford Encyclopaedia of Philosophy.

Smit, H., & Hacker, P. M. S. (2020). Two conceptions of consciousness and why only the neo-Aristotelian one enables us to construct evolutionary explanations. *Humanities and Social Sciences Communications*, 7, Article 93. https://doi.org/10.1057/s41599-020-00591-y

Stern, D. N. (2018). The Interpersonal World of the Infant. In *The Interpersonal World of the Infant*. 9780429482137

Tassi, P., & Muzet, A. (2001). Defining the states of consciousness. *Neuroscience and Biobehavioral Reviews*, 25(2), 175–191. https://doi.org/10.1016/S0149-7634(01)00006-9

Thompson, E. (2010). Mind in Life: Biology, Phenomenology, and the Sciences of Mind. Belknap Press of Harvard University Press.

Thompson, E. (2014). Waking, Dreaming, Being: Self and Consciousness in Neuroscience, Meditation, and Philosophy. Columbia University Press.

Throop, C. J., & Laughlin, C. D. (2007). Anthropology of consciousness. En P. D. Zelazo, M. Moscovitch, & E. Thompson (Eds.), The Cambridge Handbook of Consciousness (pp. 631–669). Cambridge University Press.

Tian, X., & Poeppel, D. (2015). Dynamics of self-monitoring and error detection in speech production. *Journal of Cognitive Neuroscience, 27*(2), 352–364.

Tisserand, A., Philippi, N., Botzung, A., & Blanc, F. (2023). Me, Myself and My Insula: An Oasis in the Forefront of Self-Consciousness. *Biology*, 12(4), 599. https://doi.org/10.3390/biology12040599

Tononi, G., Boly, M., Massimini, M., & others. (2016). Integrated information theory: from consciousness to its physical substrate. *Nature Reviews Neuroscience*, 17, 450. https://doi.org/10.1038/nrn.2016.44

Travis, F., & Pearson, C. (2000). Pure consciousness: distinct phenomenological and physiological correlates of. MIT Press.

Tsakiris, M., & Critchley, H. D. (2021). Interoception and self-awareness. *Nature Reviews Neuroscience*, 22(4), 215-229.

Vameşul, G. (2010). The broader horizon of passivity in Husserl's phenomenology: The concept of passivity in Husserl's phenomenology de V. Biceaga. *Research in Hermeneutics, Phenomenology, and Practical Philosophy*, II(2), 575–584

Varela, F. J. (2019). The specious present: A neurophenomenology of time consciousness. J*ournal of Consciousness Studies*, 6(2-3), 111-140.

Varela, F. J., Thompson, E., & Rosch, E. (2017). *The Embodied Mind: Cognitive Science and Human Experience*. MIT Press.

Venebra, M. (2018). Husserl. Cuerpo propio y alienación. En I. Walton, Roberto; Lerner, Salomón; Quepons (Ed.), *Anuario colombiano de fenomenología y hermenéutica* (Sociedad E, pp. 109–132). http://www.esap.edu.co/portal/wp-content/uploads/2017/10/2-Regimen-y-Sistema-Politico-Colombiano-i.pdf

Weiler, M., Northoff, G., Damasceno, B. P., & Balthazar, M. L. F. (2016). Self, cortical midline structures and the resting state: Implications for Alzheimer's disease. En *Neuroscience and Biobehavioral Reviews*. j.neubiorev.2016.05.028

Welch, B. (2014). A phenomenological-enactive theory of the minimal self.

Werner, H. (1995) (Ed.). On Expressive Language: Papers presented at the Clark University Conference on Expressive Language Behavior. *Clark University monographs in psychology and related disciplines.* Pp. 81. Worcester, Mass.: Clark University Press.

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition, 13*(1), 103–128.

Wu, W. (2018). The Neuroscience of Consciousness. En E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy. Stanford University.

Wu, Wayne and Morales, Jorge (2025). "The Neuroscience of Consciousness", The Stanford Encyclopedia of Philosophy (Summer 2025 Edition), Edward N. Zalta & Uri Nodelman (eds.)

Zahavi, D. (2003) Husserl's Phenomenology. Stanford University Press.

Zahavi, D. (2007). Thin, thinner, thinnest: Defining the minimal self.

Zahavi, D. (2012). The time of the self. En *Grazer Philosophische Studien* (Vol. 84).

Zahavi, D. (2014). *Self and Other: Exploring Subjectivity, Empathy, and Shame*. Oxford University Press.

Zahavi, D. (2017a). *Husserl's legacy*.

Zahavi, D. (2017b). Transcendental phenomenology, intentionality, and subjectivity. *Voprosy Filosofii*, *10*, 150–155.

Zahavi, D., Grèunbaum, T., Parnas, J., & Inc, E. (2004). The structure and development of self-consciousness. In *Advances in consciousness research v. 59* (pp. xiv, 160 p.).

ATTACHMENTS

Attachment 1. Glossary of important terms in neurobiology

Term	Definition
Neural network	Interconnected neural regions that activate collectively processing particular functions.
Autonomic nervous system (ANS)	The sympathetic, parasympathetic, and enteric nervous systems are the three primary divisions of the ANS. Together, these divisions control involuntary body processes and are essential for preserving homeostasis. Sympathetic division: Raises alertness and energy demand and prepares the body for "fight or flight" reactions. Parasympathetic division facilitates relaxation and recuperation through supporting "rest and digest" activities. Enteric nervous system: This network of neurons in the gastrointestinal tract, sometimes called the "second brain," affects both mental and physical states.
Neuronal hierarchy	Traditionally, the neuronal hierarchy follows a medial-lateral or central-peripheral direction. A limitation in the reviewed literature is the significant divergence in neuroscientific studies on the neuroanatomical foundations for studying self-consciousness, a divergence that mainly depends on how the hierarchical structure of brain anatomy is interpreted (Northoff, 2011)
Nested neural hierarchy	Feinberg (2009) proposes an alternative organization based on concentric rings along the neuroaxis, ranging from subcortical to cortical areas. The innermost ring (medial system) includes subcortical and paralimbic regions associated with self-related and homeostatic processes. The intermediate ring encompasses regions from the cortical midline structures (CMS), integrating also the processes from the other two rings. The outermost or peripheral ring corresponds to the lateral area, where sensory-motor processes occur.
Parallel processing	Simultaneous processing across different neural pathways, following the biological-cognitive pursuit for efficiency.
Plasticity	It is the nervous system ability to adapt to repetitive experiences by reorganizing itself (Shneider et al., 2018).
Epigenetics	Epigenetics is the study of heritable changes in gene expression that do not involve alterations to the underlying DNA sequence. It encompasses various mechanisms, such as DNA methylation and histone modification, which can influence the way genes are turned on or off in response to environmental factors or experiences. These changes can impact an organism's phenotype and may even be passed down to subsequent generations,

Term	Definition
	highlighting the dynamic interplay between genetics and the environment (Allis et al., 2007).
Interoception	It is the the sensing and interpretation of internal bodily signals.
Prefrontal cortex (PFC)	Commonly associated with tasks such as working memory, inhibitory control, planning, and other higher-order integration tasks, as well as emotional processing and self-referentiality. Its relationship with memory is more related to the temporal order or sequencing of the remembered than to the contents of memory. It is the brain region that takes the longest to fully develop as a person grows; synaptic genesis does not seem to peak until the second year of life. Similarly, while myelination of sensory and motor regions is completed during the first months of life, myelination of the PFC continues until adolescence (Pinel, 2007). The PFC contains three types of neurons whose activation varies with location, activity, and their combination in the environment. Notably, other neurons are activated by the response being executed rather than by environmental factors, with activity beginning in advance and concluding with a delay. As the region that provides general movement instructions to the premotor cortex (secondary motor cortex), it is also connected to motor conduction pathways (Pinel, 2007), which are associated with emotional or affective responses that seem to enhance physical effort (Schmidt et al., 2009).
Media prefrontal cortex (mPFC)	Within the PFC, the medial prefrontal cortex (mPFC) has shown to be particularly active when negative emotions are experienced (Pinel, 2007).
Dorsolateral prefrontal cortex (dlPFC)	It is one of the two main executive areas related to sensorimotor association; it appears to be responsible for reviewing information from the outside world (previously processed in the posterior parietal cortex), as well as executing voluntary actions and consciously controlled motor sequences.
Cingulate cortex (CC)	It is very important for various functions, connecting with areas involved in motor control, emotion regulation, cognitive processing, between others. Anatomically, the cingulum bundle connects various cortical areas that affect memory, emotion, and executive functions. It has been argued that the midcingulate region contains a motor field with direct corticospinal connections (Leech & Sharp, 2013).
Anterior cingulate cortex (ACC)	It is linked to the emotional response to pain, as opposed to the perception of pain itself; together with the Anterior Insula are crucial in the integration of emotional and bodily signals.

Term	Definition
Perigenual cingulate cortex)	It is a specific region within the ACC that is part of the limbic system; it is located near to the corpus callosum. It has been related with emotional processing and "regulating endocrine and autonomic responses to emotions" (Jumah et al, 2022).
Posterior cingulate cortex (PCC)	It is linked to visuospatial orientation and visuospatial memory. It is an important node in the DMN, being active when people prepare for future plans, recollect autobiographical memories, or only "rest"by not thinking in something specifically (Leech & Sharp, 2013). Recent evidence has studied the diversity of this subcortical area. It may also be involved in attentional auto-regulation. Overall, it is seen as active in a range of cognitive activities related to attention, memory, and error detection; it is involved in some neurological and psychiatric disorders such as Alzheimer's disease, depression, autism, attention deficit hyperactivity disorder (ADHD), schizophrenia and aging. Cortico-thalamic fibers from the PCC to the dorsal thalamus cross multiple thalamic nuclei. The specific nature of the connections between the PCC and the striatum is not well understood and further research is needed to fully elucidate these connections (Parvizi et al., 2006).
Default mode network (DMN)	It is a network of brain regions that becomes active when the mind is not focused on external, environmental tasks, hence, commonly interpreted as intrinsic neural activity (Schneider et al., 2008). It is often associated with daydreaming and wandering around or future events. The DMN includes regions such as the mPFC, PCC, and lateral parietal cortex (LPC).
Posterior parietal cortex (PPC)	The PPC is related with the spatial body representation (Blanke & Metzinger, 2019).
Periaqueductal gray (PAG)	The periaqueductal gray (PAG) is associated with pain modulation, functioning as a region of opioid receptor sites that activate descending analgesic pathways. It also receives signals related to defensive emotional responses from the amygdala (Pinel, 2007).
Insula	The insula is primarily connected to the senses of smell and taste, as well as conscious desires linked to the reward system, such as hunger or drug cravings (Pinel, 2007). Hippocampus, together with the PFC encode and retrieve temporal information (Northoff & Huang, 2017).
Striatum	The striatum is a critical component of the basal ganglia, involved in motor control, cognition, and habit formation (Leech & Sharp, 2013).
Function Magnetic Resonance Imaging (fMRI)	Measures changes in blood flow in the central nervous system.

Term	Definition
. Electroencephalography (EEG).	Measures electrical activity in the central nervous system.
Positron Emission Tomography (PET).	Measures brain function and identifies disease or injury by using a radioactive tracer.

Attachment 2. CMS and DMN main regions or hubs

CMS regions include (Northoff et al., 2011; Panksepp, 2009; Schneider et al, 2008; Weiler et al, 2016):

i. Medial prefrontal cortex (mPFC): a core CMS structure, composed by:
    a. Dorsomedial prefrontal cortex (dmPFC).
    b. Ventromedial prefrontal cortex (vmPFC) (sometimes called mOFC, medial orbitofrontal cortex) (Scalabrini et al, 2020).
ii. Anterior cingulate cortex (ACC): often referenced as the medial component alongside the mPFC. Specific regions include:
    a. Perigenual anterior cingulate cortex (pACC).
    b. Dorsal anterior cingulate cortex (dACC).
iii. Posterior cingulate cortex (PCC): a major posterior hub of the CMS, located within the posteromedial cortex, is seen as a transitional area bridging the isocortex and allocortex (Leech & Sharp, 2013).
    a. Precuneus.
    b. Medial parietal cortex (mPC).

The DMN includes the core CMS regions and expands to other interconnected areas, extensively distributed (Northoff, 2017; Scalabrini, 2020; Schneider, 2008):

i. Cortical midline regions: CMS, this is the mPFC and the PCC .
ii. Lateral and temporal regions:
    a. Anterior insula (Scalabrini, 2020).
    b. Medial temporal lobe (MTL), including the hippocampus and parahippocampal gyrus.
    c. Temporal parietal junction (TPJ) / Temporoparietal cortex.

d. Angular gyrus.
e. Secondary somatosensory cortices and medial occipital cortex

Attachment 3. Limitations of neuroscientific techniques based on images

Techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) provide insights into the neural correlates of self-consciousness. Psychosocial measurements, such as heart rate variability (HRV), are utilized to investigate self-consciousness in both emotional and physical states (Candia-Rivera, 2023). Research on the self often evaluates both self-specific and non-self-specific stimuli as explanatory variables for fMRI or PET-measured neural activity; these methods, however, may overlook the intrinsic activity of stimuli (resting state) and its impact on stimulus-induced activity. Northoff et al. (2011) highlight the importance of incorporating resting state activity in experimental designs aimed at understanding the neuroscientific foundations of self-consciousness. Fox et al. (2016) argue that it is essential to explore key aspects of self-generated neural activity using diverse methodologies to identify and address their inherent limitations.

Thus, it is suggested to use functional neuroimaging (fMRI and PET) to delve into the extent and diversity of activation regions associated with the self; but also, the use of neuropsychological lesion studies, transcranial magnetic stimulation, intracranial electrophysiology, and magnetoencephalography to find both the substrates necessarily related to self-consciousness, as well as its ontogenetic origins; the manipulation and measurement of neurotransmitters and neuromodulators to investigate the means and neurochemical modulation of this type of activity; as well as the manipulation and measurement of hormones and biomolecules to fully develop a study of self-related activities that extend beyond the CMS and involve to consider the PNS, as well as the rest of the body (Fox et al., p. 135-137).