



## Original Research Article

# Neuroethnology as a tool to comprehend the connections of the Self with the Surrounding: A Conceptual Enquiry with Hermeneutic Analysis.

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**Abstract: Background:** The relationship between the self and its surroundings is often conceptualised as a distinction between individuals and the external world.

**Objective:** This study employs hermeneutic analysis to explore neuroethnology and introduce the term as a means of understanding how the self-differentiates from its surroundings while remaining interconnected.

**Methods:** A modified Delphi-informed consensus process, conducted over seven sessions, identified six analytical domains. From 471 pooled records, 78 sources were selected for iterative thematic analysis and hermeneutic synthesis. **Findings:** The analysis differentiates between culture and ethnoculture, transmission and incorporation, embeddedness and embodiment, and biological embedding and inherited cognition. Ethnoculturally available meanings and practices become self-specific through embodiment and ethnocognition, which organise attention, appraisal, and actions. Recurrent neurocognitive and somatocognitive patterns, understood as plastic rather than fixed, may confer pre-reflective self-relevance prior to the emergence of an explicit self-concept. The term “chronopersonalisation” is introduced to describe the progressive temporal localisation of behavioural ecology into characteristic yet adaptable self-organisation. Reflexivity is considered both a method and a subject, enabling the organization derived from surroundings to be examined and reorganized. Indic accounts of lineage and self-enquiry are acknowledged as epistemic antecedents of this mode of enquiry. **Conclusion:** Neuroethnology complements neuroanthropology, cultural neuroscience, and neurophenomenology by focusing on the evolving self-surrounding relationship as one of its units of enquiry.

**Keywords:** neuroethnology; self-surrounding relations; ethnocognition; reflexivity; chronopersonalisation; hermeneutic analysis; neuroethnological enquiry; selfhood; embeddedness; ethnocultural layers of self.

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## INTRODUCTION

The relationship between the self and its surroundings is an enduring problem in individuals' ongoing attempts, across the life course, to understand their experience of living. It may first be approached not as a separation between an already constituted individual and an external world, but as a question about the conditions within which human life and selfhood become intelligible. Ingold described anthropology as an enquiry into the "conditions and possibilities of human life in the one world we all inhabit" and insisted that its task is to "study with people, not to make studies of them" [1]. Human experience is therefore encountered relationally, through participation in a world already shared with others. MacRae similarly located anthropology within the "comparison of different peoples and their ways of life and thought," while emphasising the "simultaneous embeddedness in cultural context" of what is encountered ethnographically [2].

Anthropological and ethnological enquiry has long examined persons in relation to culturally organised worlds, and the construction of personhood has been shown to vary across social and ethnocultural contexts [1,2,3]. A person may nevertheless experience oneself as an individual, although individuality develops within relationships, language, inherited meanings, social practices, ecological conditions, bodily experience, and accumulated participation in a surrounding world. The self therefore cannot be interpreted apart from the context in which ways of living and thinking acquire significance. Seeger et al approached this problem through the definition and construction of the person by society, identifying the "body as a focal symbolic idiom" and recognising that the person may be "defined on a plurality of internally structured levels" [3].

Cultural psychology challenges the notion that selfhood is a monolithic, culturally unchanging entity. Markus and Kitayama illuminated the contrasting visions of selfhood: the independent self, standing alone like a solitary tree, and the interdependent self, woven into the fabric of relationships with others. They revealed that the architecture of our thoughts, feelings, and drives shifts dramatically based on whether we see ourselves as islands or as part of a larger archipelago [4]. Matsumoto's empirical exploration underscores that these orientations are not mere cultural dichotomies but rich tapestries of diversity within and between cultures [5]. Vignoles et al. further unravelled this complexity, illustrating that global understandings of selfhood are not confined to a simplistic East–West divide but are instead a kaleidoscope of dimensions [6]. More recent work indicates that self-construal remains responsive to changing cultural and globalised conditions [7], while Indian evidence shows that values, personality, and self-construal interact within culturally specific settings rather than reproducing a uniform collectivistic model [8].

Culturally patterned selfhood is expressed in attending to and processing self-relevant information. Cultural orientation modulates self-bias in perceptual matching, indicating that the salience of self-related information is culturally conditioned [9]. Comparative self-construal measures reinforce that selfhood is multidimensional and culturally variable rather than an independent–interdependent opposition [10]. Zahavi's critique of strong social constructivism is hermeneutically important because it prevents cultural situatedness from being read as complete determination: individuality and social embeddedness remain distinguishable dimensions of personhood [11]. These studies support the stance that selfhood is neither culturally invariant nor culturally predetermined. It is organised within culturally situated fields of meaning in which relationality, self-representation, attention, evaluation, and interpretation are differently configured across persons and contexts. However, culture exists at a collective level, whereas selfhood is lived by a particular person. A conceptual gap therefore appears between culturally available meanings and their eventual organisation as personally meaningful experiences.

This study distinguishes culture from ethnoculture: a historically transmitted field of meanings, practices, relationships, symbolic categories, ecological knowledge, values, collective memory, and embodied routines within which a developing person is situated, supported by literature on cultural models, enculturation, transmission, learning, and ecological knowledge [12–23].

Cultural knowledge is unevenly distributed and variably person-specific [12]. It is integrated into cognition through enculturation [13], situated within historically transmitted systems of learning [14] and conveyed tacitly without full verbalisation [15]. Cultural structures shape attention, perception, learning, and actions [16,17]. Transmission is relational, occurring through peer learning [18], teaching [19], culturally opaque knowledge [20], knowledge networks [21], and intergenerational family practices [22]. Ecological knowledge is formed through culturally organised engagement with environments [23]. Ethnoculture is thus both precedent and possibility: it makes meanings and practices available before reflective selfhood, yet remains open to acceptance, resistance, modification, and person-specific organisation.

What is transmitted is not necessarily incorporated. Transmission moves culturally available knowledge toward the person, whereas incorporation is its integration into the person's own modes of attending, interpreting, acting, and regulating. Conceptual intermediaries are therefore required.

Embodiment is a principal intermediary. Cognition arises through interacting perception, action, bodily

state, and environment [24]; body ownership and self–other distinction depend on integrating exteroceptive, proprioceptive, and interoceptive information [26]; and internal bodily signals support self-awareness [27]. These processes need not appear as explicit self-knowledge. Park and Tallon-Baudry describe a bodily "subjective frame" organising perception without deliberate reflection [28]; interoception and sensorimotor organisation underlie the minimal self [29], a pre-reflective first-person structure [30]. Embodiment thus gives experience an implicit self-referential quality before explicit self-knowledge [26–30].

Selfhood does not arise from a single mechanism. Gallagher's pattern theory describes interacting embodied, experiential, affective, cognitive, narrative, social, and situated processes [31]; DaSilveira et al. distinguish dimensions of reflective self-consciousness [32]; bodily self-consciousness comprises ownership, self-location, agency, and first-person perspective [33]; and interoceptive signals interact with emotion and cognition [34]. Thus, selfhood is organised across overlapping bodily, experiential, cognitive, and reflective levels [31–34].

Consciousness, self, pre-reflective self-awareness, self-awareness, self-consciousness, and self-concept are related but distinct constructs. The problem is how experience becomes self-relevant prior to explicit representation. Because body representations and self–other correspondences emerge early [35], the question is how differentiation develops within the continuing physiological, relational, sensory, and environmental dependence.

Ethnographic and qualitative traditions recognise that the investigator's position, participation, and standpoint shape the enquiry [36–39]. Here, reflexivity extends to the individual's own bodily states, attention, perception, memory, appraisal, motives, responses, and inherited meanings, becoming part of the phenomenon investigated rather than a mere safeguard.

Neuroanthropology [40–43] and cultural neuroscience [44–49] show that culturally patterned experience participates in organising self-processing, cognition, neural activity, inhibitory control, perception, and behaviour. However, the question remains: how do ethnoculturally available forms become transmitted, embedded, embodied, cognitively organised, rendered self-relevant, and incorporated into a particular person's lived organisation?

The self-surrounding relation is also temporally organised. Neuroendocrine, monoaminergic, stress, sleep, melatonin, circadian, and zeitgeber processes alter the physiological states of attention, motivation, affect, cognition, regulation, and behaviour [50–55]. Biological embedding and epigenetic mechanisms may

contribute to longer-term susceptibilities, although human evidence does not justify treating culturally organised cognition as epigenetically inherited [56].

This conceptual enquiry approaches these intersecting problems through neuroethnology as a tool. It is proposed not merely as another framework for correlating culture with neural activity but as a tool for examining how ethnocultural, embodied, neurocognitive, somatocognitive, developmental, ecological, relational, and temporal processes become organised within the person. Its particular methodological proposition is that reflexive enquiry into one's own somatocognitive and neurocognitive organisation may constitute a starting unit of enquiry, rather than functioning only as a methodological safeguard.

Neuroethnology may be a contemporary disciplinary formulation, while the mode of enquiry it formalises has considerably older epistemic antecedents. Human beings have long attended to bodily states, behaviour, relationships, inherited practices, environmental conditions, suffering, agency, and the consequences of action. Neuroethnological enquiry is a systematic way of trying to understand how our experiences, behaviours, physical state, inherited knowledge, and the world around us are all connected.

The present enquiry proceeds from the central proposition that the self becomes differentiated from the surrounding without becoming independent of it. Therefore, the problem is not merely where the self ends and the surrounding begins, but how differentiation emerges within continuing biological, embodied, relational, ethnocultural, ecological, and temporal continuity.

## MATERIALS AND METHODS

### Primary research question

How can neuroethnology be used as a conceptual and analytical tool to comprehend how the self becomes differentiated from, yet remains continuously connected with, its surroundings through ethnocultural transmission, embodiment, neurocognitive and somatocognitive patterning, reflexivity, and temporal–ecological organisation?

### Subsidiary questions

1. How do ethnoculturally available meanings, practices, knowledge, relationships, and behavioural possibilities become transmitted, embedded, embodied, ethnocognitively organised, and progressively localised as self-specific organisations?
2. How do neurocognitive and somatocognitive patterning participate in the movement from pre-reflective self-relevance to reflective, narrative, and reflexively assessable selfhood?
3. What contributions does neuroethnology make to

the fields of neuroanthropology, cultural neuroscience, and neurophenomenology in elucidating the developmental, embodied, ethnocultural, ecological, and temporal continuity of the self-surrounding relationship?

### **Aim**

To conceptually and hermeneutically examine neuroethnology as a tool for comprehending the connections of the self with the surroundings, with particular attention to how ethnocultural, embodied, neurocognitive, somatocognitive, developmental, ecological, reflexive, and temporal processes participate in the differentiation and continuing organisation of selfhood.

### **Objectives**

1. To delineate what distinguishes culture from ethnoculture and examine how ethnoculturally available meanings, knowledge, practices, and relationships move through transmission, embeddedness, embodiment, and ethnocognition toward a self-specific organisation.
2. To conceptualise neurocognitive and somatocognitive patterning as recurrent, plastic, and context-sensitive organisation contributing to pre-reflective self-relevance, reflective selfhood, narrative organisation, and reflexive reinterpretation.
3. To explore how developmental experience, biological embedding, ecological conditions, lineage-associated continuity, and temporal organisation contribute to self-surrounding relations while maintaining the distinction between cultural transmission and inherited cognition.
4. To define the scope and analytical contribution of neuroethnology in relation to neuroanthropology, cultural neuroscience, and neurophenomenology, and to evaluate its usefulness as a conceptual and reflexive tool for investigating self-surrounding continuity.

### **METHODOLOGICAL APPROACH**

This study was conducted as a conceptual enquiry employing a hermeneutic analysis. This study did not aim to establish a singular causal model or conduct a conventional systematic review. Rather, the enquiry integrated theoretical, empirical, ethnographic, neurocognitive, phenomenological, chronobiological, cultural, and selected historically transmitted sources pertinent to selfhood and its relationship with the environment.

The source material was scrutinised for concepts related to culture and ethnoculture, transmission and enculturation, embodiment, ethnocognition, bodily and minimal selfhood, neurocognitive and somatocognitive organisation, reflexivity, biological embedding, lineage-associated continuity, behavioural ecology, chronobiology, neuroanthropology, cultural

neuroscience, neurophenomenology, and historically situated modes of self-enquiry. The methodological process comprised three complementary operations: conceptual enquiry, hermeneutic analysis, and reflexive neuro-ethnological enquiry.

### **i. Conceptual Enquiry**

Conceptual enquiry was used to identify, differentiate, compare, relate, and reconstruct concepts relevant to the self-surrounding relation.

Particular attention was devoted to distinguishing concepts that might otherwise be conflated, such as culture versus ethnoculture, transmission versus incorporation, embeddedness versus embodiment, biological embedding versus inherited cognition, pre-reflective versus reflective selfhood, self-awareness, self-consciousness, narrative selfhood, and self-concept, as well as patterning versus fixed pattern, and collective availability versus self-specific organisation.

Concepts were not treated as isolated definitions. Their explanatory relevance was assessed according to how they contributed to understanding the processes through which surrounding-derived organisation may become self-relevant and subsequently available for reflective or reflexive examination.

### **ii. Hermeneutic Analysis**

Hermeneutic analysis proceeded through a recursive movement between the parts and the whole. Individual findings, concepts, disciplinary perspectives, and historically situated knowledge systems were interpreted in relation to the wider question of how the self becomes differentiated from, while remaining connected with, its surroundings.

Historically and epistemically, various sources are not assumed to be equivalent to one another. Classical, ethnocultural, philosophical, phenomenological, psychological, neuroscientific, and ethnographic materials were initially analysed within their respective conceptual frameworks before any potential convergence was examined. Statements directly supported by the literature were differentiated from hermeneutic or abductive inferences derived from the current investigation.

### **iii. Reflexive Neuroethnological Enquiry**

Reflexive neuroethnological enquiry was used to analyse the data beyond the researcher's perspective. It examines how bodily states, attention, perception, judgment, memory, behaviour, inherited meanings, relationships, self-stories, and time affect a person's understanding of themselves and the environment.

In the current conceptual enquiry, it was used to explore how hidden, embodied, culturally learned, or environment-based organisation becomes subject of study and not to collect first-person data.

## METHODOLOGICAL SEQUENCE

The methodological sequence was organised iteratively rather than as a single linear search-and-selection procedure.

- a) **Preliminary scoping search:** A preliminary search, unrestricted by predefined analytical domains, was undertaken to identify literature relevant to the enquiry's problem: the differentiation of the self from, and its continuing relationship with, the surroundings. Literature on culture and ethnoculture, transmission and enculturation, embodiment, cognition, selfhood, reflexivity, neuroanthropology, cultural neuroscience, neuropsychology, biological embedding, ecological organisation, and temporal regulation established the conceptual terrain of the enquiry.
- b) **Domain development:** The authors then undertook a modified Delphi-informed consensus process across seven deliberative sessions spanning two months. Candidate domains were proposed, compared, refined, merged, or differentiated in relation to the research question during the deliberative sessions and the literature identified in the preliminary search. The consensus yielded six analytical domains:
- Domain I: Ethnocultural Field
  - Domain II: Transmission, Knowledge and Embeddedness
  - Domain III: Embodiment and Ethnocognition
  - Domain IV: Neurocognitive and Somatocognitive Patterning
  - Domain V: Selfhood and Reflexivity
  - Domain VI: Chronobiological and Ecological Organisation

These domains acted as fields of enquiry to organise the study rather than as separate categories or a fixed causal sequence.

- c) **Focused search and screening:** The agreed-upon domains informed a more focused search and screening process. Domain-specific terms and related conceptual combinations were used to extend the evidence base and identify literature directly relevant to the primary and subsidiary research questions of this study. The authors

collectively pooled a total of 471 records across the preliminary and domain-guided searches. Following the removal of duplicates and overlapping retrievals, approximately 337 potentially relevant sources remained for assessment, of which 78 were retained for the final conceptual and hermeneutic analyses. These were assessed for conceptual relevance, contribution to one or more analytical domains, explanatory value for the self-surrounding relationship, and suitability for supporting empirical, theoretical, phenomenological, ethnographic, or hermeneutic analysis.

- d) **Thematic analysis.** The selected literature was subjected to an iterative thematic analysis. While the domains provided a prior analytical architecture, themes were identified through repeated engagement with the final corpus. Recurrent conceptual relationships, distinctions, tensions, and explanatory patterns were examined across sources and consolidated into six themes:
- culture, ethnoculture and inherited meaning
  - knowledge, transmission and embeddedness
  - embodiment and self-specific organisation
  - pre-reflective and reflective selfhood
  - self-surrounding differentiation and continuity
  - temporality, neurobiology and behavioural organization.
- e) **Hermeneutic synthesis.** Finally, a hermeneutic synthesis was undertaken by moving recursively between individual findings, thematic patterns, analytical domains, and the enquiry as a whole. This process examined convergence and divergence across disciplinary and epistemic traditions without assuming direct equivalence between them. Empirically supported findings were distinguished from conceptual and abductive interpretations generated through the enquiry. The synthesis was directed toward the central proposition that the self becomes differentiated from the surrounding without becoming independent of it, and toward evaluating neuroethnology as a conceptual and analytical tool for tracing how this relation is transmitted, embodied, organised, temporally modulated, and reflexively accessible.

## FINDINGS AND DISCUSSION.

### The Problem of the Self and Its Surrounding

The earliest relation between the person and the surrounding does not begin as an abstract distinction between an internal self and an external world. From the beginning of life, physiological and sensory conditions are encountered through hunger, thermal change, touch, movement, arousal, satiation, discomfort, distress, and relief. These states evoke regulatory and behavioural responses and occur repeatedly in relation to surrounding conditions, such as

caregiver contact, feeding, sound, movement, spatial orientation, and temporal regularity. Developmental work on body representation indicates that self-related bodily organisation and self-other correspondence can emerge before mature conceptual selfhood [26,29,35].

Therefore, the surrounding does more than provide stimuli to an already constituted self. It participates in the developmental conditions through which self-related organisation becomes possible. Repeated sensory,

affective, interoceptive, regulatory, and relational experiences may contribute to recurrent ways of attending, anticipating, responding, and regulating. Such processes provide part of the experiential ground from which bodily ownership, agency, self-relevance, and increasingly explicit forms of self-awareness can emerge [26–30,35].

This position does not require the assumption that the newborn begins in a state of complete self–world undifferentiation. Early multisensory and bodily processes provide information relevant to self-generated and externally generated events, whereas interoceptive and sensorimotor integration contribute to the developing minimal or bodily self [26,29,35]. Therefore, the developmental trajectory is better understood as a process of progressive differentiation occurring within continuing dependence and coupling.

The self may consequently become distinguishable from the surrounding without becoming independent of it. Our bodies rely on the environment to keep things in check. We perceive the world through organised sensory fields, and our actions are shaped by the opportunities and limitations around us. We learn meanings through social and cultural interactions, while our biological activities are constantly influenced by our internal rhythms and external cues [24–35,50–55]. So, even though things might seem different, it doesn't mean they're disconnected.

From a neuroethnological perspective, this distinction is especially important because the surroundings include more than the material environment. It encompasses relational, ethnocultural, ecological, symbolic, bodily, and temporal conditions. The meanings available in such surroundings do not simply enter the individual as detached information. Through repeated participation, practical activity, bodily engagement, affective learning, attention, interpretation, and social interaction, they may become embedded within lived experiences and embodied within recurrent modes of sensing, appraising, remembering, acting, and regulating [12–30].

These recurrent organisations may be approached as neurocognitive and somatocognitive patternings. Neurocognitive patterning concerns the recurrent organisation of processes such as attention, perception, memory, appraisal, motivation, executive control, and response selection. Somatocognitive patterning concerns the participation of interoception, proprioception, autonomic state, affect, posture, and sensorimotor activity in cognition and action [24–34]. These should not be understood as fixed signatures. Their significance lies in their continuing plasticity, context sensitivity, developmental modification, and responsiveness to the conditions in which the person lives.

Therefore, the self-surrounding problem is twofold. First, the self and the surrounding must remain distinguishable if their relationship is to be investigated. Second, analytical distinction must not be mistaken for ontological independence. Existing neuroanthropological and cultural-neuroscientific approaches demonstrate substantial culture–brain, culture–body, and culture–behaviour interactions [40–49], while chronobiological evidence further demonstrates that organism–environment coupling extends into the temporal organisation of cognition, affect, motivation, and behaviour [50–55].

Consequently, considering the self-surrounding relationship as a matter of differentiation within continuity offers a unique opportunity to integrate evidence regarding selfhood and reflexivity. Neuroethnology contributes to existing culture–brain approaches by exploring how a person gradually becomes distinguishable as a self while remaining developmentally, bodily, ethnoculturally, ecologically, and temporally connected to the conditions of life. Its distinctive proposition is that recurrent self-surrounding relations play a role in the pre-reflective organisation from which self-relevance, reflective awareness, and later conceptualisations of self and self-concept emerge.

### **Defining Culture and Ethnoculture: From the Collectiveto Person-Specific Experience**

The movement from collective culture to person-specific and self-specific experience presents a central conceptual difficulty because culturally available meanings, practices, values, knowledge, and behavioural expectations cannot be assumed to become incorporated uniformly within individuals. Here, culture is used for the broader collective repertoire of meanings, practices, values, symbols, institutions, and knowledge shared within social worlds. Ethnoculture, by contrast, refers to the historically and relationally transmitted layer of that repertoire that becomes available to particular persons through lineage, language, social relations, ecological setting, collective memory, embodied practices, and inherited interpretive categories.

#### **a. Pathways of Cultural Transmission**

Cultural models may therefore be socially organised yet unevenly distributed across persons [12]. Enculturation provides one route through which culturally developed practices and cognitive tools become integrated into individual cognitive organisation [13], while cultural evolution situates cognition within historically accumulated systems of learning and practice [14]. Tacit knowledge may additionally be transmitted without being fully verbalised or explicitly represented [15]. Peer learning [18], teaching [19], transmission of culturally opaque knowledge [20], socially organised knowledge networks [21], intergenerational family practices [22], and culturally differentiated ecological knowledge [23] further demonstrate that cultural

transmission occurs through multiple relational and practical pathways.

#### **b. Cultural Variation in Self-Construal and Self-Processing**

Cultural variation may consequently appear not only in explicit beliefs or descriptions of the self. Independent and interdependent self-construals indicate variation in cognition, emotion, and motivation [4], while empirical evidence demonstrates considerable variation within as well as across cultural groups [5]. Multidimensional models challenge a simple East–West division of selfhood [6], and contemporary evidence indicates that self-construal remains responsive to changing cultural contexts [7]. Indian evidence similarly demonstrates relationships among cultural values, self-construal, and personality [8]. Cultural orientation may also influence self-bias during perceptual processing [9], while comparative work on self-construal measurement emphasises that culturally situated selfhood cannot be adequately reduced to a single independent–interdependent dimension [10]. Culturally patterned attention further shows that cultural variation can be expressed within basic processes of perception and contextual processing [16].

The transition from a collective culture to a person-specific organisation is not a simple transfer into a mind. Surroundings provide meanings and possibilities, but organisation depends on how they are encountered, interpreted, accepted, resisted, and modified within lives [12–23]. Tschantz et al. show that culturally patterned attentional styles can arise through interaction with material environments, providing a model through which cultural organisation may be reflected in perceptual and behavioural tendencies [17]. “culturally patterned attentional styles” refers to ways of exploring, selecting, and prioritising information shaped through engagement with culturally structured environments.

This creates an important conceptual gap. Cultural psychology demonstrates that selfhood varies with cultural organisation [4–10], while research on enculturation and cultural transmission explains several mechanisms through which socially available forms reach individuals [12–23]. However, neither implies that culturally available forms become personally operative in identical ways. The relevant question is how culturally and historically available forms become selectively organised within particular persons and acquire enduring significance within lived experience.

This study addresses this intermediate space through the distinction between culture, ethnoculture, and ethnocognition. Neuroethnological enquiry is therefore directed toward the processes through which collective cultural organisation becomes locally situated within individual experience without assuming either uniform transmission or cultural determination.

This distinction also requires the separation of biological inheritance from cultural transmission. The biological embedding of early-life adversity may alter physiological regulation, and human studies provide limited evidence for intergenerational epigenetic effects; however, methodological limitations make it difficult to infer direct transgenerational transmission of complex cognitive or cultural organisation through epigenetic mechanisms alone [56]. Person-specific organisation must therefore also be examined through social, developmental, experiential, and interpretive processes.

Indian ethnographic evidence reveals that culturally prescribed personhood is not merely a passive inheritance. Srivastava's exploration of “personality development” programs illustrates how individuals can acquire and perform bodily, linguistic, temporal, and emotional dispositions while skillfully navigating their pre-existing relational worlds [57]. This perspective supports the idea of cultural incorporation as a selective and relational process, rather than a simple replacement of one selfhood with another. Cross-cultural variations emerge in narratives that lack a neatly defined psychological self. Yang's examination of *xin/kokoro* portrays the heart as intertwined with cognition, emotion, bodily sensation, virtue, and relational life, offering a culturally grounded model where experience is woven through an embodied, relational vocabulary rather than the psyche alone [58].

Indian philosophical literature, with its accounts of *ātman* and *jīvātman*, situates the enquiry into selfhood within the realms of internal experience, continuity, action, and liberation [59]. These traditions are not substitutes for empirical models of selfhood but serve as evidence that culturally inherited conceptual systems provide resources through which individuals understand and transform themselves. Indian literature on indigenous self-mastery and wellness practices suggests that culturally embedded practices gain behavioural significance through repeated participation and structured training [60]. Interpretive work on spiritual healing highlights that health-related practices may encompass experiential, relational, embodied, and meaning-oriented dimensions that extend beyond intervention-specific mechanisms [61].

Hermeneutic analysis of cultural distress and transgenerational trauma proposes that social determinants, embodied experience, somatocognitive processes, and lineage-based practices interact within culturally situated experiences of health and distress [62]. Review of literature on Indigenous healing practices points towards experiential and person-centred forms of knowledge that remain incompletely captured within biomedical categories [63].

### **Embodiment and Ethnocognition in Self-Specific Organisation**

Embodiment is a cornerstone of neuroethnological exploration, as cognition weaves itself through the ongoing dance between the brain, body, action, and environment rather than existing as isolated representations [24]. In the current conceptual enquiry, embodiment unfolds into four interwoven dimensions: interoceptive–autonomic, which involves the sensing and regulation of internal physiological states; proprioceptive–postural, which pertains to bodily position, movement, and orientation; affective–somatophysiological, which encompasses bodily states tied to emotion, arousal, and regulation; and sensorimotor, which links perception with movement and action [24,26–30,33,34].

Empirical and theoretical work has indicated that these dimensions contribute to self-related organisation. Multisensory integration contributes to bodily ownership and self–other differentiation [26]. Interoceptive activity participates in bodily self-awareness [27], while internal physiological signalling may provide what Park and Tallon-Baudry described as a “neural subjective frame” for perceptual experience [28]. Developmental work further linked interoception and sensorimotor organisation with the emergence of the minimal self [29], while bodily self-consciousness involves interacting dimensions of ownership, agency, self-location, and first-person perspective [33].

Evidence from enculturation research also indicates that culturally developed practices and tools can become “integrated into our cognitive systems” [13]. Menary and Gillett describe a “deep integration between brain, body, and cognitive tools” [13]. Tschantz et al. further showed that culturally structured material environments can participate in “building and rebuilding our patterns of attention,” with consequences for perception, learning, action, and task performance [17].

These findings support a plausible but not yet fully demonstrated causal pathway. Repeated participation in culturally structured practices may expose the self to recurrent sensory, bodily, affective, relational, and behavioural contingencies [13,17,24]. Through learning and plastic adaptation, these contingencies may progressively influence attention, perception, bodily regulation, and action [13,17,24,26–29]. Recurrent organisations may then acquire self-relevance through bodily ownership, agency, interoceptive interpretation, affective appraisal, and regulatory experience [26–30,33,34].

Embodiment serves as a key pathway through which ethnoculturally transmitted meanings become experientially active within the self. The sequence is as follows: ethnocultural participation leads to recurrent embodied contingencies, which in turn result in bodily and cognitive adaptation. This adaptation fosters recurrent self-relevant organisation, culminating in

behavioural enactment and regulation. This sequence is derived from integrative inference based on convergent evidence rather than a singular experimentally demonstrated causal chain.

Hermeneutically, a comparable pattern is visible in the Indian indigenous health literature. Panda et al. described Indian Indigenous Healing Systems as “culturally embedded and lineage-transmitted systems of healing knowledge and practices” and emphasised transmission through “embodied practice, observation, interpretation, and guided participation” [60].

Tripathy et al. identified “embodied and symbolic practice” and “sociocultural embeddedness” as recurrent dimensions through which healing acquires experiential significance, while framing healing as a movement toward integration [61]. A hermeneutic analysis of cultural distress further described culturally embedded explanations and interventions as shaped by “ecology, tradition, belief, and inherited knowledge systems,” and related cultural disorientation to somatophysiological and somato-cognitive manifestations [62]. Earlier review-based work on indigenous healing likewise foregrounds the “experiential aspects of health” and discusses “lineage-based healing techniques” as practices requiring interpretation within their cultural and experiential contexts [63]. These accounts mutually reinforce the idea that culturally inherited knowledge is not merely stored or communicated, but is progressively expressed through embodied participation, interpretation, regulation, and practice [60–63].

Ethnocognition localises ethnoculture within the self by describing how culturally situated meanings and practices are organised within recurrent cognitive activity. Enculturation involves processes through which cultural tools and practices become “integrated into our cognitive systems” [13], producing a “deep integration between brain, body, and cognitive tools” [13]. Material culture may also participate in “building and rebuilding our patterns of attention”, thereby influencing perception, learning, action, and task performance [17]. Ethnocognition, therefore, refers not to the reproduction of an entire culture within the self but to the self-specific organisation of attention, appraisal, memory, interpretation, practical knowing, and action within an ethnocultural field.

Embodiment and ethnocognition are complementary but non-identical. Embodiment is all about how our experiences, shaped by culture, are expressed through our bodies and become a significant part of how we feel and act. Ethnocognition, on the other hand, deals with how these experiences are organised within us and how it shapes our approaches to the surrounding. Their interaction provides a plausible route through which transmitted meanings become self-relevant, influence self-regulation and self-concept, and subsequently be

enacted, embodied and then potentially retransmitted [13,17,24,26–30,33,34,60–63].

### **From Patterning to Reflective Selfhood: pre-reflective organisation of the self-surrounding relation**

The preceding analysis positioned embodiment and ethnocognition as complementary processes through which ethnoculturally situated experience may become self-specific. This raises a central question: if bodily, cognitive, relational, ecological, and culturally situated organisation begins before deliberate self-reflection, how does such organisation acquire self-relevance and later become available to reflective self-concept?

Evidence from embodied cognition, interoception, bodily self-consciousness, developmental studies, and pattern theories of self suggests that self-related organisation is dynamic and can precede explicit conceptualisation [24,26–35]. Indian indigenous health literature adds a complementary hermeneutic perspective by locating culturally embedded knowledge within lineage transmission, embodied practice, guided participation, meaning-making, and somatocognitive experience [60–63]. The following three propositions further clarify this transition.

#### **A. Patterning rather than pattern**

Patterning is preferable to pattern because neurocognitive and somatocognitive organisation is recurrent without being fixed. Embodied cognition places perception and action within ongoing interactions between the brain, body, and environment [24]. The integration of multiple senses in the body adapts to changes in sensory input [26], while processing internal bodily signals changes with physiological conditions and helps with self-awareness [27,28]. Gallagher's pattern theory also views selfhood as an interaction of embodied, experiential, emotional, cognitive, narrative, social, and situational aspects, rather than a single stable entity [31].

Within this enquiry, neurocognitive patterning refers to recurrent organisation across attention, perception, memory, appraisal, motivation, executive control and response selection. Somatocognitive patterning refers to the recurrent integration of interoceptive, proprioceptive, autonomic, postural, affective, and sensorimotor processes. Cultural learning can modify attentional tendencies [17], and developmental and bodily experience can alter bodily ownership, agency, and sensorimotor organisation [26,29,35]. Circadian timing, sleep, stress, monoamines, and melatonin modify the physiological conditions in which cognition and behaviour occur [51–55].

Indian indigenous-health literature also depicts culturally embedded knowledge as processual. Panda et al. emphasised transmission through embodied practice, observation, interpretation, and guided participation

[60] while Tripathy et al. highlighted further that embodied practice and sociocultural embeddedness as common aspects of healing [61]. Cultural confusion has been linked to psychosomatic, somatophysiological, and somatocognitive symptoms [62]. Literature on lineage-based healing also emphasizes on experiential and culturally specific practices [63]. In a hermeneutic sense, patterning refers to a continuous organization that can stabilize enough to affect experience and behavior, while still being adaptable through learning, physical state, culture, environment, and time.

#### **B. The Self-Surrounding Relation Begins Before Explicit Self-Concept**

An explicit self-concept is not necessary for the organisation of the self-surrounding relationship. Multisensory bodily representation aids in differentiating the self from others [26]. Interoception and sensorimotor organisation contribute to the development of the minimal self [29], while early body representations and self-other correspondence manifest prior to the formation of a mature conceptual selfhood [35]. Internal physiological signals may also establish a neural subjective frame, facilitating the organisation of perceptual experience from a situated bodily perspective without the need for deliberate reflection [28]. Minimal self-consciousness similarly refers to a fundamental first-person organisation that does not necessitate conceptual self-analysis [30].

This supports the proposition that pre-reflective self-awareness precedes deliberate self-reflection, where bodily states, affect, agency, self-location, and action may gain self-relevance before conceptual representation [26–30,33,35]. Enculturation may occur through practice and participation [13], and Panda et al. showed embodied acquisition of cultural knowledge [60]. The self-surrounding relation therefore begins as lived and organised participation before it becomes reflective representation.

#### **C. From Pre-reflective “Mineness” to Reflective Self-Concept**

Pre-reflective organisation, experiential “mineness”, and reflective self-concept should be distinguished rather than treated as equivalents. Multisensory integration contributes to bodily ownership [26], interoception to bodily self-awareness [27], and internal physiological signalling can provide a subjective frame for experience [28]. Minimal self-accounts likewise emphasise first-person embodiment and agency before explicit conceptualisation [29,30].

Mineness denotes the experiential quality through which a sensation, action, perception, memory, or meaning is encountered within one's own continuing field of experience. This is not yet an articulated self-concept. Rather, it reflects implicit self-relevance grounded in ownership of own body with respect to agency, affective salience, interoceptive organisation,

and processing of recurrent experiences [26–30,33].

Culturally embedded practice may add further interpretive layers to this field. Indigenous self-mastery traditions illustrate how repeated embodied practice, observation, interpretation, and guided participation can organise transmitted principles within lived activity [60]. Spiritual healing literature similarly describes selfhood and meaning, relational and narrative processes, embodied and symbolic practice, and restoration of coherence as interacting dimensions [61]. Cultural distress and lineage-based healing literature further indicate that inherited meanings, embodied health, and somatocognitive processes can remain intertwined within culturally situated experiences [62,63].

Reflective selfhood introduces another level. Self-consciousness permits the self to become an object of attention and interpretation [32], whereas pattern theory indicates that explicit self-representations remain connected with embodied, affective, cognitive, social, and narrative dimensions [31]. May be a provisional progression can be stated as follows. It begins with pre-reflective organisation and self-relevance. It then develops into experiential mineness, self-awareness, and reflective self-consciousness. Finally, it leads to a self-concept influencing attention, memory, behaviour, signals' interpretation, and regulation, feeding back into experience [31,32]. This sequence is an interpretive synthesis of [31,32], not an experimentally demonstrated progression.

The three propositions thus indicate that selfhood is more accurately conceptualised as an ongoing process of organisation rather than a static internal configuration. Patterning accounts for recurrence without implying permanence; pre-reflective self-awareness elucidates how self-related organisation can precede conscious reflection; and the notion of 'mineness' signifies the experiential transition through which recurrent bodily and cognitive organisation becomes increasingly pertinent to the self. The literature on indigenous health introduces a culturally contextualised perspective by demonstrating how embodied practice, guided participation, meaning-making, sociocultural embeddedness, and lineage transmission can structure experience beyond explicit propositional knowledge [60–63]. Consequently, the reflective self-concept does not initiate the relationship between the self and its surroundings; rather, it interprets and reorganises pre-existing relations, too, however, it could be exceeding its role beyond that which calls for a separate enquiry.

From a neuroethnological standpoint, the enquiry shifts from solely questioning what the self knows about itself to exploring how recurrent embodied, cognitive, ethnocultural, ecological, and temporal relations are organised as self-relevant experiences before, during,

and after they enter reflective awareness.

### **Reflexivity, Surrounding-Derived Organisation, and Cultural Transmission**

The preceding sections examined the emergence of self-related organisation prior to the development of an explicit self-concept and its gradual accessibility to reflective awareness. The following enquiry is: once such organisation has developed, how can it be reconsidered or reorganised? How should biological embedding be distinguished from culturally transmitted cognition? Additionally, in what ways is the self-surrounding relationship temporally structured? The sections and subsections below extend the enquiry from the emergence of self-related organisation to its reinterpretation, transmission, and modulation with the passage of time.

#### **a. Reflexive Enquiry and the Reorganisation of Self-Concept**

Self-concept should not be viewed as a static concept. Gallagher's pattern theory integrates the reflective and narrative dimensions of selfhood within a broader framework encompassing embodied, affective, cognitive, social, and situated processes [31]. Self-consciousness further enables aspects of the self to become subjects of attention and evaluation [32]. These perspectives provide opportunities for assumptions and orientations that operate implicitly and later become available for examination.

Ethnographic scholarship provides a methodological parallel because it examines how the observer's own position, participation, and relations with the field shape what is noticed, interpreted, and represented. Embodied reflexivity draws attention to how the body's (corporeal) participation, standpoint, and relational location shape or influence the interpretation [36] of what is experienced and understood and further correlated with one's conceptualisation of one's self at that point. Ethnographic closeness alters both engagement with and understanding of a field [37]. Person-centred ethnographic approaches emphasise reciprocal processes of "affecting and being affected" [38], while cross-cultural qualitative methodology calls for attention to the position from which interpretation occurs [39]. Reflexivity, in this sense, cannot be synonymous with introspection, as it concerns the examination of the conditions through which experience has been interpreted.

#### **b. Surrounding-derived organisation and the distinction between Reflectivity and Reflexivity**

Two brief works stemming from Indic epistemology, axiology, and hermeneutic traditions contain conceptual antecedents or principles that align with neuroethnological enquiry, which situates human enquiry within sustained engagement with nature and questions concerning identity, origin, and purpose [64, p.27]. It explains that life is extensively "mentored",

beginning with parental and immediate relational surroundings and extending to the learning of names, objects, dangers, practical uses, habits, routines, rituals, and cultural conventions [64, p.50]. Hermeneutically, this indicates that many categories through which the surroundings are recognised and acted upon are acquired before their assumptions are deliberately examined. Such acquired organisation may subsequently influence how the self interprets both its surroundings and itself.

The second work develops this issue more explicitly toward reflexivity. It describes immediate surroundings as providing cues for “life course management” and notes that prevailing practices may be considered adequate without sufficient examination of their underlying assumptions [65, pp.8–9]. It further argues that living systems acquire biases from their surroundings and that recognising gaps within both the self and surroundings may contribute to further organisation [65, p.11]. The conceptual movement is therefore from participation in surrounding-derived organisation to an enquiry into the conditions through which that localised organisation of the self was acquired.

This distinction is useful for separating reflectivity from reflexivity. Reflectivity concerns direct attention to one’s thoughts, actions, feelings, and experiences. Reflexivity also examines how these interpretations are shaped by prior relationships, embodied histories, cultural assumptions and surrounding conditions. Within neuroethnology, reflexivity can be treated as an epistemic tool for examining the formation of self-related organisations. While it may or may not directly change one’s self-concept, it can make previously implicit assumptions open to reinterpretation and potential re-organisation.

### **c. Cultural Transmission, Lineage, and Developmental Learning**

Biological embedding and cultural transmission operate at different levels of explanation. Biological embedding concerns physiological or epigenetic changes produced by experience, whereas cultural transmission concerns how meanings, practices, and knowledge are learned, shared, and sustained socially, which contributes to how the self processes the experience and at what level. Cultural knowledge is socially distributed and organised [12], therefore existing across relationships and communities rather than being generated independently within a single self. Enculturation, the process of learning how to think, act, interpret, and participate within one’s cultural surroundings, involves incorporating culturally developed tools and practices into cognitive activity through learning and participation [13].

Cultural evolution depends on the transmission, modification, and retention of socially available

information [14], while tacit knowledge, knowledge expressed through skilled practice or understanding without being fully expressed in words, may be acquired through participation, even when it is incompletely verbalised [15]. This distinction becomes particularly relevant when considering deeper ethnocultural layers, where the development of self-concept and embodiment may involve forms of continuity that differ from explicit instruction or propositional knowledge. Such continuity may be preserved through named lineages, apprenticeships, recurrent practices, traditions in any form, and culturally recognised structures of descent.

An example of chikitsa, which broadly refers to treatment or management, illustrates this distinction. Dalal, in *Cultural Psychology of Health in India*, refers to the Atharva Veda and its categorisation of chikitsa into Atharvana Chikitsa, Angirasa Chikitsa, Daivi Chikitsa, and Ausadhi Chikitsa [66, p.50]. He also discusses the Agnivesha Tantra, identifying Agnivesha within the discipleship of Rishi Atreya, and refers to the Kashyapa Samhita. Atreya is, in turn, described as having received training from Rishi Bharadwaja [66, p.50]. Regardless of how these traditions are interpreted within contemporary cultural psychology, their explicit preservation of teacher, disciple, textual, and lineage associations remains epistemically significant. Hermeneutically, such documentation supports the existence of identifiable pathways through which specialised healing knowledge was attributed, preserved, differentiated, and transmitted. These may be understood as “ancient Indic systematic enquiry or research lineages”: historically situated knowledge traditions in which continuity was marked not only by the survival of texts but also by remembered relationships of transmission.

A related exposition describes distinctive ethnographic and cultural expressions preserved across Indic ethnocultural and indigenous practices, while also identifying recurrent principles that extend beyond particular belief systems into approaches concerned with the organisation and refinement of life and awareness [67, p.6]. The same account refers to effect-oriented practices preserved through transmission and associates ancestry and identity with validated and clearly defined constructs such as gotra and shakha [67, p.6]. These categories show how cultures find ways to gain knowledge, identity, and continuity within known ancestral hierarchies.

This distinction is also evident in the developmental transmission. Peer interactions contribute to cultural learning [18]. Teaching supports cumulative cultural transmission [19]. Opaque practices may require guided instruction because their rationale cannot always be inferred directly from observations. [20]. Knowledge circulates through social networks [21], family and community relationships [22] and culturally organised

ecological engagement [23]. This interpretation receives further ethnographic support from accounts of “living traditions” and their ethnocultural moorings. Sahoo documents distinctive continuities, such as artistic identity among the Saoras and culturally constituted relations between a newborn and a deceased ancestor among the Parajas [68, pp.4–5]. These examples do not establish the biological inheritance of cultural cognition; rather, they demonstrate how lineage, ancestry, social interpretation, and culturally preserved categories can structure the field into which a developing self enters. These findings point towards that ethnocultural identity consequently influences pre-reflective self-awareness by shaping the meanings, relationships, practices, and expectations encountered before they become objects of deliberate contemplation.

### **Biological Embedding, Lineage-Associated Organisation, and Temporal Modulation**

The previous section elucidated that self-related organisation is significantly acquired through mentorship derived from one's surroundings. It can become a subject of reflexive enquiry, and cultural knowledge along with lineage-associated identities are transmitted through learning, participation, and relational continuity. This account addressed the manner in which meanings and categories are integrated into the developing self and how they may subsequently be reinterpreted. However, it did not explore the physiological conditions through which the self interacts with its environment, nor did it address how continuity across generations should be attributed to biological rather than cultural processes.

This section addresses these questions. Initially, it differentiates biological embedding, defined as experience-related physiological and epigenetic change, from the cultural transmission of meanings and interpretive structures previously discussed. It then examines how lineage-associated continuities, including constructs such as gotra and shakha, may be analysed through the concept of wellspring genetics without being reduced to molecular mechanisms. Finally, it investigates the temporal organisation of the self–environment relationship, wherein circadian and neuroendocrine processes modify the conditions under which the environment is encountered and interpreted. Collectively, these subsections consider cultural transmission, biological embedding, and temporal modulation as interacting yet analytically distinct conditions that shape the emergence of self-specific patterning.

#### **a. Biological Embedding and Inherited Cognition: a distinction**

Biological embedding describes a different process. Early adversity and other exposures may alter physiological regulation and may be associated with epigenetic changes that influence later biological susceptibility [56]. Such findings support the biological

consequences of environmental exposure across development and, in some circumstances, across generations [56]. However, they do not demonstrate the inheritance of culturally specific meanings, beliefs, memories, classifications, or interpretive structures.

This distinction is particularly important in discussions of cultural distress and transgenerational trauma. Cultural disruption may be associated with psychosomatic, somatophysiological, and somatocognitive manifestations [62]. Such associations do not establish biological transmission of culturally organised cognition. The interpretation of distress continues to depend on language, social learning, shared practices, lineage knowledge, and culturally structured surroundings.

#### **b. Wellspring genetics and lineage-associated self-organisation**

Neuroethnological enquiry need not remain confined to molecular mechanisms when examining lineage and inheritance. The construct of “wellspring genetics” permits an enquiry into how genealogical continuity, lineage affiliation, inherited dispositions, ethnocultural identity, and transmitted knowledge may contribute to differentiated forms of self-organisation. Indic constructs such as gotra and shakha, whose genealogical and pedagogical associations extend into early textual traditions such as the Rig Veda, provide historically persistent frameworks through which ancestry, knowledge transmission, and identity have been organised [67]. Therefore, their significance is not exhausted by whether particular molecular variants or transgenerational epigenetic mechanisms can be demonstrated. Rather, they provide an ethnological basis for asking how lineage-associated dispositions and identities interact with developmental surroundings, embodied experiences and inherited knowledge.

In this sense, wellspring genetics extends enquiry beyond biological traits or transmitted trauma toward the question of why neurocognitive and somatocognitive patterning acquires distinctive self-specific configurations within historically continuous lineages. Molecular genetics and epigenetics may constitute components of this enquiry, but they do not exhaust its explanatory scope.

These [66,67,68] permit neuroethnological inference that lineage-associated knowledge, identities, and dispositions may persist through ethnocultural transmission and become localised within self-specific behavioural organisation [66–68]. Therefore, the relevant question is how such continuities participate in the emergence of distinctive neurocognitive and somatocognitive patterning, rather than whether they can be explained solely through molecular or transgenerational biological inheritance.

Biological embedding and inherited cognition are

related but different processes. Their interaction might help in self-specific organisation without reducing one to the other.

### **c. Temporal Organisation of the Self–Surrounding Relation**

The self-surrounding relation is organised through time as well as through embodiment, culture, and ecology. Physiological systems vary across recurrent temporal cycles, thereby altering the conditions under which perception, cognition, affect, and action occur.

Developmental neuroendocrine processes operate across life history and contribute to changing emotional and behavioural organisation [50]. Dopaminergic signalling participates in circadian regulation and links reward processes with the temporal organisation of neural activity [51]. Monoaminergic systems vary in relation to circadian rhythms and sleep deprivation [52]. Stress physiology interacts bidirectionally with circadian organisation [53]. Circadian networks influence cognition, locomotor activity, and mental functioning [54]. Melatonin contributes to circadian entrainment and sleep promotion, linking environmental light–dark cycles with internal temporal regulation [55].

These findings indicate that the same surrounding condition does not necessarily produce identical responses at different temporal states. Attention, arousal, motivation, affective responsiveness, sleep pressure, and physiological regulation vary across time. The self–surrounding relation therefore occurs through changing biological conditions rather than against a temporally neutral background.

Hermeneutically, what appears to be a characteristic response of the self may partly depend on when an encounter occurs, the physiological state in which it occurs, and the temporal regularities through which similar encounters have previously been experienced. Social routines, work schedules, sleep–wake timing, feeding, ritual activity, and environmental light may consequently intersect with endogenous biological rhythms. Temporal organisation therefore becomes part of the conditions through which the surrounding is encountered and interpreted.

These above parts extend the analysis of selfhood from pre-reflective organisation to a self that remains interpretable, modifiable and temporally situated. Reflexive enquiry may make previously implicit organisations available for such examination [31]. The two brief works discussed above contribute a compatible conceptual account in which self-related organisation is substantially shaped through surrounding-derived mentorship [64, p.50], while reflexive engagement permits inherited assumptions and acquired biases to become objects of examination [65, pp.8–11]. Biological embedding should remain analytically distinct from inherited cognition as

physiological susceptibilities may be biologically sustained [56], whereas culturally organised meanings depend on learning, participation, and interpretation [12] and the interplay of many background factors. Temporal organisation adds a further condition because circadian, neuroendocrine, sleep, stress, monoaminergic, and melatonergic processes modify the physiological state through which the self and surroundings interact [50–55].

Neuroethnology therefore approaches self-related organisation as culturally transmitted through some pathways, biologically embedded through others, temporally modulated, and potentially open to reflexive reinterpretation. The sources reviewed permit the neuroethnological inference that lineage-associated knowledge and organising principles may persist through culturally and relationally mediated transmission, while their expression becomes localised within self-specific behavioural organisation. Therefore, the relevant question is how such transmitted continuities interact with developmental experience, embodiment, biological timing, and behavioural ecology in the emergence of distinctive neurocognitive and somatocognitive patterning, rather than presuming that these patternings are transmitted directly through molecular or transgenerational biological inheritance.

### **Chronopersonalisation**

The current conceptual enquiry examines how cultural transmission, biological embedding, and changes over time come together, having shown their interaction while keeping them analytically separate. The dynamic nature of physiological states necessitates that self-specific patterning be understood not solely by the influences present but also by their timing, recurrence, duration, and developmental context. This understanding leads to the concept of chronopersonalisation, which refers to the progressive temporal localisation of behavioural ecology into a characteristic yet adaptable self-organisation. The subsequent section explores this concept in detail.

Chronopersonalization is identified and discussed in this conceptual enquiry as the progressive adaptation, structuring, and manifestation of behavioural ecology within the interacting rhythms of the body, environment, personal experiences, and ethnocultural background. The central concept addresses time and its connection to the phenomenon of chrono morphic dynamics, which includes two interrelated aspects: pre-reflective self-awareness and neuroethnological reflexivity of the self. These aspects are influenced by factors originating from biological, developmental, ecological, experiential, and ethnocultural sources. These influences become unique to the individual not merely by their presence, but through their timing, frequency, duration, developmental context, and interaction with previously organised experiences.

Chronomorphic dynamics is about how things like biological rhythms, development, environment, motivation, and culture mix and change over time to influence how individuals express themselves. It sets the stage for behavioural ecology, as the way our bodies interact with the environment gets organised into typical patterns of activity, regulation, and meaning. Over time, this process leads to a unique chronopersonalization for each person, evolving dynamically through their experiences.

Enculturation provides culturally structured practices and cognitive tools through which experience is repeatedly organised [13]. Culturally patterned surroundings can influence how attention is recurrently allocated [17], while embodied cognition situates cognitive activity within continuing relations among bodily state, action, task, and surrounding conditions [24]. Therefore, these processes operate through repeated encounters rather than as isolated inputs.

Time related aspects of biology add another level of organisation. Developmental neuroendocrine processes vary across life-history trajectories and influence emotional and behavioural organisation [50]. Dopaminergic signalling interacts with circadian regulation [51], while monoaminergic activity varies with circadian state, sleep, and sleep deprivation [52]. Stress systems interact bidirectionally with circadian organisation [53]. Circadian networks influence cognition and behavioural activity [54], and melatonin links environmental light–dark periodicity with internal temporal regulation [55]. Therefore, the surrounding is encountered by the self through changing physiological states rather than against a temporally neutral background.

Chronopersonalisation describes how these recurrent influences may progressively become localised as characteristic ways of sensing, attending to, regulating, interpreting, acting, and relating. Such organisations may acquire relative stability through repetition while remaining responsive to altered surroundings, subsequent experiences, developmental changes, and reflexive reinterpretation. Therefore, chronopersonalisation does not imply a fixed self-specific signature. It describes the progressive temporal localisation of behavioural ecology into characteristic but plastic self-specific organisation, while examining the temporal dynamics through which recurrent self–surrounding interactions evolve into distinct forms without reaching developmental closure.

**What neuroanthropology, neurophenomenology, and cultural neuroscience explain, and what remains** Neuroanthropology, neurophenomenology, and cultural neuroscience provide insights into how the self is formed in relation to the environment. Neuroanthropology focuses on the reciprocal relationships among cultural practices, lived

experiences, embodiment, and neural organization [40–43]. Cultural neuroscience investigates how culturally patterned environments are linked to variations in self-representation, cognition, inhibitory control, and learned symbolic systems [44–48]. Neurophenomenology examines the relationship from a first-person perspective, aligning experience with third-person neuroscientific observation so that each constrains the other's interpretation.

The convergence of these approaches is evident in their rejection of an isolated model of selfhood; they collectively assert that the self cannot be understood independently of its cultural, social, embodied, and experiential contexts. However, they diverge primarily in their starting points of inquiry. Neuroanthropology initiates its analysis from culturally situated life, exploring its relationship to neural and behavioral organization. In contrast, cultural neuroscience typically begins with quantifiable cultural variations, investigating the corresponding neural processes. Neurophenomenology, on the other hand, starts with lived first-person experiences, seeking to systematically relate these to neural dynamics.

Ethnoculturally situated knowledge systems encompass distinct models of selfhood, cognition, and behavioural differentiation. A comparative psychological analysis of Sāṃkhya–Yoga delineates ancient Indian systems as possessing "very rich, empirically derived psychological theories" and investigates cognition, behaviour, personality organisation, and various modes of perceiving reality [74]. Another comparative study on consciousness identifies a framework that connects the phenomenal with the psychological and the physical, defining *vimarśa* as "self-reflexive, active awareness" [75]. These studies imply that the surrounding environment provides more than mere external cultural content; it may also convey the conceptual systems through which the self learns to interpret experience, behaviour, subjectivity, and its relationship to the world.

Current neurocognitive models delineate the organisation of this relationship. A systems-based mindfulness framework differentiates between non-conscious sensory–affective–motor processing, present-moment experiential subjectivity, and the narrative self, which reconstructs autobiographical experiences from the past and projects them into the future [76]. The same framework demonstrates that attentional selection is influenced by competing representations of both the external world and the self's relation to it [76]. A pattern-theory perspective expands on this by conceptualising selfhood as a dynamically integrated configuration encompassing embodied, prereflective, affective, behavioural, cognitive, reflective, narrative, social, ecological, and normative processes [77]. Neurophenomenological research further differentiates the narrative self from the minimal self, which is

characterised by a prereflective sense of "for-me-ness," and illustrates how first-person enquiry can be systematically linked to neural investigation [78].

The central enquiry extends beyond the impact of culture on the brain or the quantification of subjective experiences. It concerns the progressive internalisation of the external environment within the self. This involves the transmission, embodiment, ethnocognitive organisation, and prereflective self-relevance of ethnocultural meanings, practices, classifications, relationships and behavioural possibilities. These elements were subsequently integrated into narrative selfhood and subjected to reflexive examination. This unresolved transition from external organisation to lived selfhood delineates the domain where neuroethnological enquiry becomes essential.

### **What Neuroethnology adds**

Neuroethnology redefines both the initial focus and units of enquiry. Instead of primarily investigating cultural-group differences and their neural or behavioural correlates, it starts with available and socially transmitted ethnocultural organisation related to self and its ongoing dynamics surroundings, exploring how this becomes progressively localised within lived selfhood. Consequently, one of its fundamental units of enquiry is not culture or brain considered in isolation, but rather the self-surrounding relationship. This relationship encompasses repeated interactions among meanings, practices, relationships, knowledge, behavioural expectations, ecological conditions, and bodily experiences.

A relationship of this kind can be understood only by reading each self against the shared horizon from which it was formed; therefore, the **neuroethnological** task begins with the passage from what is collectively available to what is individually taken up. Its scope extends from collective availability to self-specific organisation. Distributed knowledge exists without incorporation [12]; enculturation and tacit knowledge show practices entering activity nonverbally [13] [15]; and embodied cognition situates incorporation in the activity-environment [24].

Neuroethnology, therefore, differentiates "processes" and phenomena that culture-brain models might conflate as transmission differs from incorporation, embeddedness from embodiment, biological embedding from inherited cognition, and shared ethnoculture from identical self-organisation. It distinguishes availability from uptake, social embedding from bodily embodiment, biological transmission from cognitive organisation, and shared culture from identical selfhood, each requiring and following their unique developmental and interpretive paths.

Once these distinctions are drawn, interpretation must follow the encounter itself because what a culture offers

acquires meaning only through the particular self that receives it. Therefore, neuroethnological enquiry asks what is transmitted and what happens after it encounters a particular self. It examines which ethnocultural forms become salient, incorporated, expressed, interpreted, or subsequently questioned. A neurocognitive model of self-processing is pertinent in this context, as attentional selection can be influenced by competing representations of the world and the self in relation to that world. Dispositional and experiential factors determine what becomes "contextually self-relevant" [76]. This framework also distinguishes between non-conscious sensory-affective-motor organisation, present-moment experiential subjectivity, and autobiographical narrative self-processing [76]. Neuroethnological enquiry can therefore investigate localisation across levels, extending from pre-reflective bodily organisation to explicit self-concept.

Localisation across levels is rarely legible as a single representation; as in reading a text, the parts are understood through the whole and the whole through its parts, so the self must be held in view as a configuration of parts and the ongoing phenomena influencing the expression of the self with respect to its connections to the surroundings. A pattern theory account further supports this scope by treating selfhood as a "dynamical gestalt" involving interacting embodied, pre-reflective, affective, behavioural, cognitive, reflective, narrative, social, ecological, and normative processes [77]. These dimensions are interrelated and the alteration of one can reorganise the relationships among the others. This is particularly important for neuroethnology because ethnocultural influences need not appear as "discrete cultural representations". Instead, they may be distributed across postures, affect, attentional preference, behavioural habits, interpretation, social role, ecological engagement, and systems of expressed normativity for the self and its narrative identity.

If the self is viewed as a configuration, it also acts as a reader. The individual interpretations of own-self organization return to reshape that organization. This is why reflexivity is integral to neuroethnology as both a method and a subject matter. Neuroethnology incorporates reflexive enquiry as both its subject and method, treating reflexivity as both the focus of study and the approach to studying it. Individuals explore how embodied, cultural, and cognitive influences become personally significant and reshape their self-understanding. Neurophenomenological research illustrates that "disciplined first-person accounts can be systematically coordinated with third-person neuroscientific observations", with neither being considered independently sufficient [78]. Neuroethnology expands this concept to ethnoculturally informed selfhood by investigating whether attentional dispositions, embodied responses, inherited meanings, regulatory tendencies, assumptions, and self-narratives can be the subjects of focused examination. Thus, it

serves as a “conceptual and analytical tool” by offering a defined object of enquiry, a unit of analysis, and a sequence of interpretive operations. The focus is on the localisation of ethnocultural organisations within lived selfhood; the unit of analysis is the evolving self-surrounding relationship; and the analytical task is to trace the connections over time among transmission, embeddedness, embodiment, ethnocognition, neurocognitive and somatocognitive patterning, self-relevance, narrative organisation, and reflexive accessibility. The aim is not to replace neuroanthropology, cultural neuroscience, or neurophenomenology but to integrate findings across these fields and reconstruct how ethnocultural continuity becomes a distinctive, adaptable, and potentially examinable self-specific organisation.

With its object and interpretive task now defined, the scope of neuroethnological exploration can be expressed simply that it stretches to every corner where inherited meaning is experienced, reimagined, and transmitted by the self with respect to adaptation to its surroundings. The scope of neuroethnology includes the study of personhood, lineage, and transmission, ethnocognition, embodied regulation, life-course adaptation, ethnological reflexivity, and self-culture. It examines how inherited and culturally mediated knowledge becomes self-relevant through attention, appraisal, embodied memory, regulation, and action. It also studies how these processes are shaped by behavioural ecology, biological timing, development, and lived experience. Neuroethnology further addresses adaptive reinterpretation and retransmission across the life course. Neurobiological or physiological measures are included when they directly clarify explanatory questions.

### **Is Neuroethnological Enquiry an ancient and primordial epistemic practice, and what are its epistemic antecedents?**

To describe neuroethnological enquiry as primordial is not to claim that neuroethnology existed historically as a named discipline. This claim concerns a recurrent mode of enquiry into the self and its relation with the surrounding, one that precedes contemporary disciplinary divisions. The earlier accounts considered here locate self-formation within knowledge, practices, relationships, and assumptions acquired from the surrounding [64,65]. Indic healing histories preserve explicit teacher-disciple and textual pathways through which specialised knowledge was transmitted across lineages [66] dating to differing time periods over the past millennia, while accounts of living traditions illustrate continuing relations among ancestry, ethnocultural identity, practice, and collective memory [68]. The relevant continuity is therefore epistemic, as the self has long been examined not as an isolated entity, but through its relations with inherited knowledge, lived practice, lineage, embodiment, and surrounding.

Classical systems deepen this proposition, since self-related enquiry within them was internally differentiated rather than organised around an undivided concept of self. The Vedāntasāra distinguishes cognitive, determinative, mnemonic, and self-referential functions [69], while the Chāndogya Upaniṣad situates enquiry concerning self and mind within broader relations of instruction, life processes, knowledge, and existence [70]. Their significance for neuroethnology does not lie in any claim that they represent early neuroscience. Rather, they demonstrate that the organisation of self-experience and its relation to wider conditions of existence could itself become an explicit object of transmitted enquiry.

Contemporary comparative studies offer a bridge without requiring retrospective equivalence. A psychological examination of Sāṃkhya–Yoga treats an ancient Indian system as containing theories of cognition, consciousness, behavioural differentiation, and ways of perceiving reality [74], and this is one of the many prominent Indic methodologies in approaching self-surrounding relations. A comparative study of consciousness as per the 11th century thinker Abhinavagupta identifies an account in which phenomenal, psychological, and physical dimensions are related and describes vimarśa as “self-reflexive, active awareness” [75]. These examples matter because they show that inherited ethnocultural systems may transmit not only propositions about the world but also the methods and conceptual distinctions through which the self interprets its own cognition, experience, and relation to what surrounds it.

Contemporary self-processing models render this continuity analytically tractable. A systems-based neurocognitive framework distinguishes non-conscious sensory-affective-motor organisation, present-moment experiential subjectivity, and autobiographical narrative self-processing [76]. A pattern theory account situates prereflective awareness, embodiment, affect, cognition, reflection, narrative, social relations, ecological situatedness, and normative organisation within a dynamically integrated self-pattern [77]. Together, these models indicate that enquiry into the self can operate across several levels, from bodily and prereflective organisation to explicit reflection and self-narration. Neurophenomenology provides the most direct methodological link. A contemporary account of Advaita school of approaching self-enquiry describes the minimal self as a pre-reflective first-person perspective carrying a sense of “for-me-ness” and treats self-enquiry as a “systematic phenomenology of selfhood” [78]. It further proposes coordinating disciplined first-person phenomenological descriptions with third-person neuroscientific investigations, rather than granting either independent epistemic priority [78].

The neuroethnological proposition may therefore be stated more precisely as follows - reflexive enquiry into the organisation of the self and its relation with the surrounding may itself be culturally transmitted, historically sustained, and repeatedly re-enacted as an epistemic practice. Neuroethnology is a contemporary disciplinary articulation, but the mode of enquiry it formalises belongs to a much older continuum of at least a few millenia in the minimum, in which selfhood has been observed, differentiated, interpreted, cultivated, and reconsidered through continuing relations among the body, knowledge, lineage, practice, experience, and surroundings. The contemporary disciplinary formulation of “neuroethnology”, together with the coining of the terms for its phenomena of enquiry, such as “chronopersonalisation” and “behavioural ecology”, is attributed to Soumya Tripathy and Prakash Chandra Panda. Their expertise lies in somatocognitive and neurocognitive patterning in self-surrounding relations research, spanning approximately three decades. Both are senior researchers in Indic traditional knowledge systems, consciousness studies, somatocognitive sciences, and contemplative science, based in Bhubaneswar, Odisha, India, and are authors of the present conceptual enquiry.

### Recommendations

The present conceptual enquiry supports the use of neuroethnology as a tool for investigating how the self becomes differentiated from, yet remains continuously related to, its surroundings. Future work should operationalise the self-surrounding relation as the unit of enquiry, and not treat culture, brain, body, or self-concept as variables. Studies should examine how ethnocultural meanings, practices, classifications, and possibilities move through transmission, embeddedness, embodiment, ethnocognition, self-relevance, narrative organisation, and accessibility.

The empirical development of this approach would benefit from designs that combine ethnographic observation, first-person phenomenological description, behavioural assessment, and selected neurocognitive, somatocognitive, physiological, or chronobiological measures when these directly address the explanatory question. Longitudinal and developmental studies are especially important because the present study proposes patterning, chronopersonalisation, and self-specific organisation as temporally evolving processes rather than fixed signatures. Within-group variation should be examined alongside between-group variation so that shared ethnoculture does not produce identical forms of selfhood.

Future neuroethnological research should also preserve several analytical distinctions developed in this study: transmission should not be equated with incorporation, embeddedness with embodiment, or biological embedding with inherited cognition. Lineage-associated continuities, including culturally recognised

genealogical and pedagogical structures, should be examined without reducing their significance to either molecular inheritance or symbolic description alone.

Reflexive enquiry should be developed as both a method and an object of investigation. A disciplined examination of attention, bodily states, appraisal, inherited meanings, regulatory tendencies, self-narratives, and temporal states may help identify how surrounding-derived organisation becomes self-relevant and subsequently reorganised. Neuroethnology should therefore remain integrative rather than replacement-oriented, connecting neuroanthropology, cultural neuroscience, neurophenomenology, ethnology, embodiment research, and chronobiology while retaining the historically and ethnoculturally situated meanings through which the self interprets its relation to the surroundings.

### CONCLUSION

This conceptual enquiry proposes the term “neuroethnology” and also as a tool for comprehending the connections between the self and the surrounding. Its central proposition is that the self becomes differentiated from the surrounding without becoming independent of it. Ethnocultural transmission, embodiment, ethnocognition, neurocognitive and somatocognitive patterning, developmental experience, biological timing, and reflexivity provide analytically distinct but interacting pathways through which this relation becomes self-specific.

The enquiry further suggests that selfhood is better understood as interplay of patternings rather than as fixed. Pre-reflective bodily and experiential organisation can precede the explicit self-concept, while reflective and narrative processes may subsequently interpret and reorganise already established relations. Chronopersonalisation extends this account by locating self-specific organisation within recurrent biological, ecological, experiential and ethnocultural time.

Neuroethnology does not replace neuroanthropology, cultural neuroscience, or neurophenomenology. Its contribution lies in connecting their explanatory domains around the evolving self-surrounding relationship and making reflexive enquiry constitutive of that analysis. As a contemporary disciplinary articulation with older epistemic antecedents, its principal value is heuristic and integrative; the proposed relations now require careful empirical operationalisation and testing.

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