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# A Continuum of Consciousness

## From Wakefulness and Sentience Towards Anoetic Consciousness

***Abstract:*** *The concept of sentience proposed by Pereira Jr. (this issue) partially overlaps with the concept of anoetic consciousness that I have proposed in previous work. This commentary focuses on functional and phenomenological similarities and differences between them.*

**Keywords:** anoetic consciousness; sentience; wakefulness; control of homeostasis; body awareness; feeling.

### 1. Introduction

In this commentary, I focus on the conceptual relations between *sentience* (Pereira Jr., this issue) and my conceptualization of *anoetic consciousness* (Vandekerckhove, 2009; Vandekerckhove and Panksepp, 2009; 2011; Vandekerckhove, Bulnes and Panksepp, 2014; Panksepp, Vandekerckhove and Yovell, 2019). Both terms refer to interrelated phenomena but display some important differences worth clarifying. Within the reflection on consciousness and subjective

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experience, the relationship between the self, memory, and awareness has been considered in depth. Integration of these findings within this domain of knowledge brings insight into different stages of consciousness of being in the world (Vandekerckhove, 2009). The conceptualization of a continuum of consciousness, starting with being awake, helps us to understand the availability of a vast number of conscious experiences and the continuous underlying stream of consciousness we experience.

## 2. A Continuum of Consciousness, from Being Awake and Sentient, Towards Anoetic Consciousness

### *2.1. Wakefulness*

Certain neural systems such as the ascending reticular system, the autonomic nervous system, and the endocrine system are crucial to control arousal, wakefulness, sensory alertness, and readiness to respond. In the autonomic nervous system, efferent and afferent processing input to and from the body link neural processes to basic homeodynamic processes of the internal and visceral organs. Sensory experiences of being awake, but also of pain and pleasure, first emerge from the integrated operation of brain structures in the brainstem, ascending through the midbrain, hypothalamus, thalamus, and the basal forebrain. Being awake is a systemic homeostatic process controlled at deep levels of the bottom-up subcortical system such as by the brainstem, as well as at higher levels by cortical prefrontal control.

### *2.2. Sentience*

In the target paper (TP), Pereira Jr. defines sentience as the capacity of feeling based on a dynamic process of homeostasis control, currently called allostasis. Sentience, according to Pereira Jr., does not involve basal homeostasis *per se*, but is rather the *capacity* of controlling the system to promote the recovery of biochemical homeostasis, or, in other words, sentience involves *the capacity of allostasis*. As the precondition for consciousness, *sentience* is correlated with the dynamics of chemical homeostasis and hydro-ionic waves in living neural and astroglial tissue (Pereira Jr., this issue). The state of this complex biochemical system is critical for the formation of bioelectrical patterns such as the synchronization of neuronal activity necessary for conscious experience. Information from the sense organs is initially

encoded by the firing rates of individual receptor cells and corresponding groups of neurons. It emerges with the response of excitable cells to external stimuli changing cellular homeostasis. Adaptive astroglial functioning such as the propagation of ionic waves results in allostasis, while astroglial dysfunctioning results in the lack of control of deviations from basal homeostasis towards recovering stability. Both efferent and afferent intero- and exteroceptive inputs to the autonomic nervous system influence homeostasis (Berntson, Gianaros and Tsakiris, 2018). Corresponding physiological processes of the sentience capacity, such as interoceptive loops between the central nervous system and the whole body, interact with the environment, resulting in the state of being awake and awareness of sensorial experience (Pereira Jr., this issue). In particular, the continuous stream of bottom-up signals — e.g. heart and gastrointestinal tract and subcortical inputs — shapes homeostasis, physiological sensation, and affective experience (Panksepp, 1998; Vandekerckhove and Panksepp, 2011).

In dictionary definitions, sentience is the: 'the quality of being able to experience feelings, responsive to or conscious of sense impression' or 'the capacity of feeling things through physical senses'. This concept of sentience relates to the capacity and potentiality of somatosensorial and proprioceptive experience. The word sentient derives from the Latin verb *sentire*, which means 'to feel'. The prefix, 'sen', matches the beginnings of common English words including *sen*timent, *sen*sory, and *sen*sation — reflecting a double meaning of the term that includes sensorial experiencing, as well as affective feeling. Following these definitions and citing Spinoza's philosophy, Pereira Jr. uses 'sentience' to refer to both the capacity of sensing and of experiencing affective feeling, a dispositional state that contains a range of potentialities, of which only a subset is made actual at each moment in the stream of consciousness, depending on the dynamic interaction with the physical and social environment.

### *2.3. From sentience towards anoetic consciousness*

Sentience, in my approach, subsequent to the state of being awake (e.g. being alive and alert), but not necessarily self-aware (e.g. it is not a self-indexical awareness state), is possibly the most rudimentary level within the continuum of consciousness. In this framework, sentience reflects the capacity for unconscious somatosensorial information processing and conscious experience. Sentience, as well

as anoetic consciousness, can primarily be conceived as most of the time co-extensive with 'unconsciousness', similar to the 'pre-conscious domain' referred to by Velmans (2000). Sentience can be illustrated by the ability of fishes and birds to orient their bodies to face incoming currents, even in the absence of visual cues, by sensing a flow on either side of their body via their bilateral mechanosensory lines or rheotaxis (Oteiza *et al.*, 2017).

In perceiving and experiencing the environment without necessarily being aware of it, or noticing it, certain information is present in the organism as an internal representation in oneself. Not only is the sensory input informing sentience unconsciously pre-processed, one does also not necessarily perceive the internal modification or existence of the state of one's brain (Velmans, 1991a). Nor is much of the processing, by which associations and memories become active, conscious. We never become consciously aware of automatic neural processes of encoding, storage, and reactivation of information, in opposition to the state of conscious awareness, which is more a controlled process. Living organisms usually do not have introspective access to most forms of underlying information processing (Velmans, 1991b). Some implicit stored experiences, such as some early childhood experiences, might never return into consciousness by deliberate recalling but remain implicitly felt (Gendlin, 1964). Eventually, these experiences may be unexpectedly triggered by an associated situation or memory instead, or may be masked in a transformed form, influencing the affective mood without the individuals' awareness of their influence. Mostly they work implicitly through our ability to experience meaning associated with corresponding bodily felt experiences. The whole complexity of a situation remains implicitly working in the body (*ibid.*). The body's implying includes more organized anoetic complexity than we can yet think, say, or act upon. For processing commonly thought of as conscious, the phenomenal experience accompanying that processing follows the processing to which it most closely relates and cannot enter it (Velmans, 1991a; 2014; 2021).

### *2.4. Foreground and background*

As Zeman (2001) stated, in consciousness, there is always a foreground and a background determined by the limited capacity of the consciousness at a given moment. The culmination of lower-ordered and higher-ordered brain processes starts in sentience, where unconscious sources of different sources of sensorial information processing

processes meet each other, resulting in an intact state of integrated consciousness. In phenomenal experience, it is expressed by the continuous sensory input which makes us realize that we are awake instead of being asleep. The external flow of contextual events interacting with the internal flow of information processing is part of this sensing and the experiential character of anoetic consciousness. Even then, sentience and anoetic consciousness are always present in the background of our phenomenal experience. They only come into the foreground of awareness when the stimulus is sufficiently salient, or when attention is deliberately focused onto it. Even then, in daily life, they mostly do not involve a clear object of content and are characterized by an initial absence of content or vague experience, which in interaction with the environment and the internal pre-conscious processing of the subject can begin to form a representation of an object at the moment this organismic sensorial state is *intense* enough to be expressed in a bodily and or affective experience in awareness.

*Esse est percipi*, and sensations exist in awareness when they are intense enough. Being sentient to the point of experiencing a sensation is a phenomenon that goes beyond more than mere sensing, for it involves an internal state in which information about the internal and external environment is processed by the system, contributing to sentience. Sensations are thus only experienced in awareness when there is a shift of attention to one's somatosensorial state in response to the environment and the realization of it; then, the sensory information gets a new status. From being merely the means of sensing, it becomes an object in its own right (Cole, 1998). The subject can then say, 'this is happening to me, I am having a sensation'.

Living organisms have many and very generalized detection abilities for features like light, sound, temperature, or the presence of objects, air, or water. Recognizing, determining, and describing a bodily experience, the characteristics of a sensorial experience such as the pitch of a sound, the characteristics of an image, and other descriptors are the result of a *reflective sensitivity* to sensorial features, which may also be called the description of sensing, or what I call *sentience in awareness*. When sentience is processed in awareness, it refers to what Thomas Nagel describes as the ability of any entity to have sensorial experiences, to have states that '*feel like something* to be in' or 'to be anything at all' (Nagel, 1974). Even invertebrates, such as flies or sea snails, may possess the neural structures underlying somatosensorial detection and sensing.

Awareness of how the body reflects daily-life stressors alters in itself the physiology patterns affecting the sensation of it in awareness (Berntson, Gianaros and Tsakiris, 2018). It strengthens neuronal and axonal brain dynamics in somatosensorial bottom-up subcortical areas, as well as in more top-down regulatory areas, such as medial prefrontal regions (Herwig *et al.*, 2010). These brain regions are particularly sensitive to physiological oscillations, e.g. respiration rate, respiration amplitude, and heart rate (Mather and Thayer, 2018). There may be 'limited experiencing', implying some sort of phenomenality at the level of sentience. The minimal requirement for considering an organism sentient is if it can notice basic sensations, such as hunger, thirst, and pain. The 'experience' involves the *minimal capacity* to process the qualities associated with internal and external sensations. The information from the senses becomes the material of sentience when, and only when, it is used as data by a complex analysis, driving action, thinking, and feeling, about what to do about it. The phenomenological character of the experience depends upon the stage or complexity of information processing, as required to determine the consequential reaction. The experienced end products are qualities or *qualia*, properties of the inner and external world, 'experienced' by the 'organism' or reflected upon through a '*first-person perspective*' (Velmans, 1991a,b; 2014; 2021). Although all levels of information processing and consciousness occur within the world, are indistinguishable from, and part of the world, and shaped by the world, yet, it is the organism that 'experiences' it, or the 'I' of the individual that reflects on it, through self-reflection.

### *2.5. Anoetic consciousnesss*

Being sentient and experiencing a sensation involves an internal state in which information about the internal or external environment is processed by the system, so that it can then evolve through higher-order information processing to higher levels of consciousness. *Sentire*, or pure somatosensorial experiencing, occurs mainly in the here-and-now with minimal involvement of past experiences or memory. Anoetic consciousness can remain unconscious and can be represented in awareness as anoetic feeling, or experiential awareness. As sentience represents an earlier, more primary stage, it acts as a transitory phase towards representation in anoetic consciousness, including a somatosensorial and affective experience of life. In an analogous fashion, human primary consciousness is based on

sentience prior to any form of awareness or contextualized subjective experience, which can be situated already at the level of anoetic consciousness, influenced by the history of the subject in time and context, or the subject's episodic autobiographical memory (Vandekerckhove, 2004).

In the continuum of consciousness, anoetic consciousness already involves the influence of affective priming, encoding, and consolidation of information in memory. Despite the fact that sentience contains the representation of unconscious somatosensorial — and thus body — information in memory schemata, it is less dependent on the history of the subject, and more determined by the present. Newborn infants do not remember explicitly in time and context, nor do they reflect on the origin of their knowledge, or on their own experience of their organism. They sense their body and the implicit experiential information about themselves and the world developing a first '*sense of self*' and *identity* as an underlying stream of their existential being and acting. Even when young children are not yet capable of retrieving specific personal events on an explicit level, they possess somatosensorial, procedural, and affective information at an implicit level about themselves, integrated as anoetic consciousness.

Anoetic consciousness below the threshold of attention has a profound shaping and conditioning effect on further levels of consciousness, such as noetic and autonoetic consciousness. As developed first in Vandekerckhove (2009), the concept of stages of consciousness relies on implicit experiential, sensory, and *procedural-affective* 'self-experience', already apparent at an anoetic level of consciousness, evolving towards knowing consciousness, such as 'noetic' and 'autonoetic' consciousness, based on semantic and episodic memory systems (Vandekerckhove, 2004; 2009). When this bodily felt sentience and anoetic consciousness interact with symbols and words, explicit anoetic meaning develops. For instance, to grasp the atmosphere and quality of a Mozart symphony, or a romantic dialogue, an empathetic (Schreel, 2020), anoetic stance is required.

## 3. Sentience and Anoetic Consciousness

To conclude, sentience involves the ability to sense without the affective-loaded experience and subjective meaningfulness that we find in fully anoetic consciousness.

In terms of phenomenology, sentience especially implies the underlying condition of being alive in the present, or a 'here-and-nowness'

(Seth, Suzuki and Critchley, 2012), while anoetic consciousness already has a meaningful subjective history. Anoetic consciousness involves not only implicit sensorial processing and representation in awareness by sensations, but also the capacity of bodily felt affective experience. It involves the implicit encoding and implicit reactivation of past experiences represented in affective somatosensorial schemata, in turn shaping the experience of the here and now. As body awareness is the actualization of sentience in awareness, anoetic consciousness overlays a further affective level upon the continuum of consciousness, equivalent to the actual representation in awareness of the subjective sense of existential reality. As a state of being in the stream of consciousness, sentience gives us *an embodied experience of presence* (*ibid.*), as a precondition for an affective bodily experience of the 'here and now', or experience of a continuing being, *self in presence*, or existential *sense of self*.

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