

Concept Paper

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Concept Paper

Subjectica: Sensory Circulation

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Abstract

Contemporary cognitive science increasingly acknowledges the embodied nature of perception, decision-making, and subjective experience. However, dominant models continue to treat bodily signals primarily as secondary correlates of cognitive or emotional processes, rather than as primary regulators of cognitive orientation. This paper introduces the concept of sensory circulation as a foundational regulatory mechanism underlying embodied cognition. Building upon prior works *Subjectica: A Lateralized Embodied Model of Cognitive Stance* and *Subjectica: Sensory Circulation and Pre-Motor Readiness in Embodied Decision-Making*, the present article formulates sensory circulation in academic terms as a dynamic, attention-modulated flow of afferent and proprioceptive signals distributed across bodily configurations. Attention is conceptualized not as a purely mental act, but as a functional mechanism that enables, amplifies, or inhibits sensory circulation through specific bodily regions. We argue that variations in bodily configuration—such as tonic distribution, asymmetry, axial organization, and segmental accessibility—directly shape the character of the sensory stream. This stream, in turn, establishes a stable cognitive background from which perception, motivation, and decision-making emerge. Narrative self-reports, conscious intentions, and explicit reasoning are treated as secondary products of this regulatory process rather than its causal origin. By reframing the body as an operational interface of subconscious regulation, this paper positions sensory circulation as a primary determinant of cognitive orientation. This approach offers a non-interpretive, observable framework for analyzing embodied decision-making, bridging phenomenological experience with neurobiological and behavioral dynamics.

Keywords: embodied cognition; sensory circulation; bodily regulation; attention as regulation; neurophenomenology; cognitive background; subjectica; interoception; body representation

Introduction

Building upon prior works *Subjectica: A Lateralized Embodied Model of Cognitive Stance* (Shopin, 2025) and *Subjectica: Sensory Circulation and Pre-Motor Readiness in Embodied Decision-Making* (Shopin 2026), the present article formulates sensory circulation in academic terms as a dynamic, attention-modulated flow of afferent and proprioceptive signals distributed across bodily configurations.

Despite significant advances in cognitive neuroscience, a persistent conceptual asymmetry remains in how the body is treated within models of cognition. While perception, emotion, and action are now widely accepted as embodied phenomena, bodily processes are still commonly framed as expressions or outputs of internal mental states rather than as regulatory mechanisms in their own right (Gallagher, S., 2005; Varela, F. J., Thompson, E., & Rosch, E., 1991).

In prevailing cognitive and psychological paradigms, cognition is typically understood as originating in representational, symbolic, or inferential processes, with the body serving a supportive or expressive role. Even within embodied cognition frameworks, bodily signals are often reduced to interoceptive markers of affect or to motor correlates of decision execution. This reduction obscures a more fundamental regulatory function: the role of bodily configuration and sensory flow in shaping the cognitive field itself.

The present work proposes that human functioning is more accurately described as a system of sensory circulation. Sensory circulation refers to the continuous, context-sensitive flow of sensory signals—proprioceptive, interoceptive, and exteroceptive—through the body, modulated by attention and constrained by bodily configuration (Friston, K. J., 2012; Clark, A., 2015). This circulation is not passive. It actively structures the cognitive background within which perception, evaluation, and action become possible.

Crucially, attention is not treated here as a purely mental faculty or executive command. Instead, attention is conceptualized as a functional regulator of sensory circulation: it determines which bodily regions remain perceptually accessible, which signals are amplified, and which are relegated to background processing. Where attention is absent, sensory circulation becomes attenuated or fragmented, and regulation shifts toward automated, subconscious patterns.

From this perspective, the body does not merely reflect psychological states. It organizes them. The configuration of the body in a given context—its tonic patterns, asymmetries, axial alignment, and segmental availability—directly determines the structure of sensory circulation. This structure establishes a stable cognitive background from which thoughts, emotions, motivations, and decisions emerge.

What is commonly described as “personality,” “beliefs,” or “motivational traits” can thus be reinterpreted as relatively stable configurations of sensory circulation across contexts. These configurations are not symbolic representations stored in the mind, but embodied regulatory patterns maintained through repeated attentional and postural dynamics.

Within this framework, narrative cognition and conscious decision-making are secondary phenomena. They arise after sensory circulation has already configured the cognitive field. Decisions do not originate in narrative reasoning; rather, narrative reasoning articulates and justifies decisions that have already been embodied through sensory regulation.

This shift—from cognition as narrative-driven to cognition as circulation-driven—has significant implications for cognitive science, psychology, and applied domains concerned with behavior change and self-regulation. It suggests that effective modulation of cognition requires working not primarily with beliefs or interpretations, but with the embodied conditions that make certain cognitive orientations possible in the first place.

The following sections develop this claim by (1) formally defining sensory circulation as a regulatory construct, (2) clarifying the role of bodily configuration in shaping sensory flow, and (3) demonstrating how cognitive background and decision-making emerge as downstream effects of embodied regulation rather than as its source.

Sensory Circulation and Attention as a Regulatory Mechanism

In most cognitive models, attention is conceptualized as a top-down mental resource responsible for selection, prioritization, and control of information processing. Within such frameworks, attention operates primarily on representational content: stimuli, thoughts, memories, or tasks. However, this conceptualization leaves unexplained how attention exerts its regulatory influence prior to representation, particularly at the level of bodily readiness and perceptual availability.

The concept of sensory circulation reframes attention as a *functional regulator* of bodily signal flow rather than as a purely mental operation. Attention determines which regions of the body remain perceptually accessible and actively integrated into ongoing regulation. When attention is directed toward a bodily area, afferent signals from that region are amplified, temporally stabilized, and integrated into the ongoing sensory stream. Conversely, when attention is withdrawn, sensory input from that region is attenuated, fragmented, or relegated to background processing.

This attentional gating does not merely change subjective awareness; it reorganizes the underlying sensory flow that shapes cognitive orientation. Attention functions as an on-off or gain-modulation mechanism for sensory circulation, directly influencing the density, continuity, and coherence of bodily input entering central processing systems (Posner, M. I., & Petersen, S. E., 1990, Aston-Jones, G., & Cohen, J. D., 2005, Lutz et al, 2008). In this sense, attention operates at a pre-

representational level, shaping the conditions under which cognition unfolds rather than selecting among already-formed mental contents.

Attention is conceptualized not as a purely mental act, but as a functional mechanism that enables, amplifies, or inhibits sensory circulation (Rizzolatti, G., Riggio, L., Dascola, I., & Umiltà, C., 1987; Longo, M. R., & Haggard, P., 2010). Importantly, sensory circulation is not uniform across the body. Different bodily regions exhibit varying degrees of sensory accessibility depending on context, prior learning, and adaptive history. Attention dynamically redistributes sensory circulation across these regions in response to situational demands. This redistribution constitutes a primary regulatory act, preceding and constraining cognitive appraisal, emotional labeling, and behavioral choice.

From this perspective, attentional processes are inseparable from bodily regulation. Attention does not “observe” the body; it configures it. The state of attention at any moment defines the topology of sensory circulation and, by extension, the structure of the cognitive field.

Bodily Configuration and Cognitive Background

Bodily configuration refers to the moment-to-moment organization of the body as a regulatory system. This includes the distribution of muscular tone, postural alignment, axial organization, symmetry or asymmetry between sides, and the relative accessibility of different bodily regions to sensory processing. These features are not passive biomechanical states; they actively shape the flow of sensory information.

Variations in bodily configuration systematically alter the character of sensory circulation. For example, increased tonic rigidity restricts micro-variability in afferent feedback, producing a narrowed and stabilized sensory stream. In contrast, flexible and distributed tonus supports richer, more adaptive sensory flow. Similarly, asymmetrical configurations bias sensory input toward specific action tendencies and interpretive frames, influencing how environmental information is weighted and integrated.

The cognitive background emerges directly from this sensory organization. Rather than being constructed through explicit beliefs or deliberative reasoning, the cognitive background is a pre-reflective field that defines what feels possible, relevant, threatening, or actionable in a given context. It determines attentional bias, motivational direction, and readiness for action before conscious evaluation occurs.

Crucially, this background exhibits stability over time. Recurrent bodily configurations—shaped by learning, social conditioning, and adaptive responses—produce relatively stable patterns of sensory circulation. These patterns, in turn, give rise to what are commonly described as enduring psychological traits, dispositions, or personality features. In this framework, such traits are not abstract mental properties but embodied regulatory patterns maintained through repeated sensorimotor organization.

Thus, bodily configuration functions as a regulatory interface between context and cognition. It translates situational demands into structured sensory flow, which then stabilizes a particular cognitive background. Cognitive change, therefore, cannot be fully understood without reference to changes in bodily organization and sensory circulation.

Narrative, Decision-Making, and Secondary Cognition

Narrative cognition—self-descriptions, beliefs, explanations, and justifications—is often treated as the central driver of human behavior. Decisions are commonly assumed to originate from conscious reasoning processes, with bodily responses following as expressions or implementations of these decisions. The sensory circulation framework challenges this sequence.

Within this model, narrative and explicit decision-making are secondary phenomena. They emerge after the cognitive background has already been configured through sensory circulation. By

the time an individual articulates a reason, belief, or intention, the underlying regulatory state has already biased perception, valuation, and action readiness.

Decision-making, in this sense, is not a discrete cognitive event but the culmination of an embodied regulatory process. Sensory circulation establishes a field of affordances—what appears viable, safe, desirable, or necessary. Narrative reasoning then selects among these affordances, often retrospectively constructing coherence and justification for actions that have already become embodied tendencies.

This does not imply that narratives are irrelevant. Rather, their function is modulatory and stabilizing rather than generative. Narratives help consolidate embodied regulatory patterns over time, reinforcing specific sensory configurations through repetition and meaning-making. However, without corresponding changes in bodily organization and sensory circulation, narrative interventions alone have limited capacity to alter the cognitive background.

Understanding narrative as secondary clarifies why purely verbal or interpretive approaches often struggle to produce durable change. They operate downstream of the primary regulatory mechanisms that define cognitive orientation. Sustainable change requires engagement with the embodied conditions that give rise to narrative content in the first place.

Discussion: Implications for Cognitive Science

The introduction of sensory circulation as a primary regulatory construct has several implications for cognitive science and related disciplines. First, it challenges representational models that locate cognition primarily in symbolic or inferential processes detached from bodily regulation. Sensory circulation emphasizes that cognition is grounded in the continuous organization of bodily signals modulated by attention.

Second, this framework provides a bridge between phenomenological descriptions of experience and neurobiological accounts of regulation. By focusing on observable features of bodily configuration and attentional distribution, sensory circulation offers an operational level of analysis that does not rely on subjective interpretation alone.

Third, the model reframes longstanding constructs such as personality, motivation, and selfhood. These are not treated as internal entities or stable belief systems, but as emergent properties of recurrent sensory configurations. This perspective aligns with dynamic systems approaches while offering a concrete regulatory mechanism linking body, context, and cognition.

Finally, the sensory circulation framework suggests new directions for research and application. Investigating how attentional modulation of bodily regions alters sensory flow, cognitive background, and decision patterns may yield more precise models of human behavior. Such work would benefit from integrative methodologies combining behavioral observation, physiological measurement, and phenomenological reporting.

In summary, sensory circulation positions the body not as a peripheral contributor to cognition, but as its primary regulatory medium. Cognition, in this view, is less a process of thinking *about* the world and more a process of being *organized* within it through embodied sensory regulation.

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