Phenomenology, Systems Theory, and Neurobiology of Consciousness: Causal Collapse

1. Introduction

The question of consciousness remains one of the central challenges of philosophy and the interdisciplinary sciences. Phenomenological approaches – especially in the tradition of Edmund Husserl and its further developments in the 20th and 21st centuries – have chosen an approach that refers strictly to experience itself. They try to grasp consciousness as a structure of appearance and to assert it against naturalistic reductions.

This essay presents an alternative theory: the model of *causal collapse* (Stegemann 2025a). It describes consciousness not as a metaphysically grounded subjectivity, but as a structural phenomenon that arises in a recursive system state that can no longer be causally separed. Consciousness is therefore a real, physically describable state of the brain, but not an empirical object in the narrower sense. The "collapse" marks the limit of analytic decomposability – in exactly the same form in which phenomenology insists on the indivisibility of consciousness, but from a different perspective.

The aim is to bring this theory into a systematic examination of central representatives of phenomenology – with Husserl as its origin, and with Merleau-Ponty, Waldenfels and Zahavi as modern continuations. The aim is to make it clear that the concept of collapse is not only an alternative approach to consciousness, but is also capable of transferring central phenomenological insights into a system-theoretical-empirical structure – without resorting to corporeality or metaphysical subject.

2. Husserl: Unity of Experience and Transcendental Subjectivity

Edmund Husserl describes consciousness as an intentionally structured experience. At the center is the transcendental ego, which functions as *a unit of performance* of the constitution of meaning. In *Ideas I* (1913) he formulates:

"We want to get to the things themselves!" (*Ideas I*, §6) – that means to turn to pure givenness, beyond all natural world assumptions.

The phenomenological path of reduction (epoché) suspends the validity of the world and directs attention to what appears in consciousness – and how it

appears. Consciousness is always experience *as a unit*, not as an accumulation of data. Husserl speaks of an "intentional correlation structure" in which consciousness is always already directed towards something through its acts – a "consciousness of ...".

There is a structural correspondence in my model: *causal collapse* refers to the state of the brain in which such a division into independent sub-processes is no longer possible. The system – biologically speaking: the brain – enters a state of internal causal inseparability. The result is a functional unit that cannot be further dismantled without losing its quality. This is exactly what Husserl describes with the concept of the "unity of manifoldness" (*Zeitbewusstsein*, §36).

However, there is a fundamental difference: while Husserl posits the *transcendental ego* as a necessary source of meaning, the collapse model understands the ego as a derived phenomenon – as a product of the integration process, not as its prerequisite. Causal collapse is not a subject, but a structural state that makes the emergence of subjective perspectivity possible in the first place. In this respect, it can be said:

Where Husserl speaks of the transcendental subject, the collapse model speaks of the structural event.

3. Merleau-Ponty: Corporeality as a Condition of Experience?

Maurice Merleau-Ponty shifts the focus of phenomenological analysis of consciousness from the intentional structure to the bodily constitution of the subject. In *Phenomenology of Perception* (1945) he writes:

"The body is our general means of having the world." (p. 203)

For Merleau-Ponty, the body is not an object among others, but the prerequisite for reference to the world and experience in general. Subjectivity is constituted in the execution of perception, and this is always bodily mediated. The body is not an observed body (*body-object*), but *a lived body* (*body-subject*).

This shift to corporeality leads to a different basic structure of the concept of consciousness: reflection does not start in pure given (Husserl) or in systemic inseparability (collapse model), but in the untheoretical, embodied experience of the world.

This is where my criticism comes in: Consciousness is not a phenomenon of the body as a whole, but a structure-dependent state of the brain. The body is a condition, but not a place of consciousness. The difference is crucial: just as the heartbeat is a state of the heart – not of the body as a whole – consciousness is a state of the brain. The body provides input, orientation, situational reconnection – but the specific quality of self-experience and world experience does not arise from the body, but from the internal system structure of the brain in collapse.

Merleau-Ponty's theory remains oriented towards phenomenologically motivated subjectivity without providing a structural or functional analysis. The concept of collapse, on the other hand, allows us to explicate the conditions of experience without falling into naturalistic reductionism – because it understands consciousness as an emergent structural state, not as a mere product function of physiological stimuli.

4. Waldenfels: Strangeness as the Origin of Experience?

Bernhard Waldenfels develops his phenomenology from a basic figure of strangeness. In *Topography of the Foreign* (1997) he formulates:

"The beginning is not with a subject, but with the call to which you have to answer." (p. 16)

For Waldenfels, consciousness is not an autonomous execution, but a response structure that is triggered by the foreign, the inintegrable. Accordingly, experience is always *an answering* event, not originally self-imposed intentionality. Strangeness is not merely thematic content, but constitutive force.

In my theory, the question of origin does not arise as a claim by an outside, but as *internal structural instability*. The collapse is not a call from outside, but a collapse of internal separability – a form of systemic self-relation that presupposes neither an "other" nor a "foreign". Foreignness in Waldenfels' sense is thus not disputed, but it has no ontological priority. It is the result of cognitive difference generation – not its prerequisite.

This also shifts the concept of responsiveness: what in Waldenfels' case is a dialogical event between inside and outside, in the collapse model becomes the dynamic of internal causal structures that lead to a new quality in a state of

maximum interdependence. The system response is not a reaction to alterity, but the transformation of complexity into structural coherence.

5. Zahavi: The Prereflexive Self and Its Limits

In numerous works, such as Self-Awareness and Alterity *(1999) and* Subjectivity and Selfhood *(2005), Dan Zahavi emphasizes* the immediacy of a "pre-reflective self-consciousness" that is inherent in every intentional experience. This "minimal self" is not an object of attention, but the implicit self-givenness of every act of consciousness.

Zahavi writes:

"I am not aware of myself as an object, but as someone who experiences, feels, thinks – without focusing on myself." (*Subjectivity and Selfhood*, p. 22)

This structure should not be generated by reflection or social mediation, but should be regarded as a constitutive moment of experience. Zahavi resists both naturalistic reductions and constructivist positions that derive self-confidence entirely from linguistic or social interaction.

My model of causal collapse accepts what Zahavi describes as the immediacy and non-objectivity of the self – but it locates this phenomenon not in an original "I", but in a dynamic state of structural integration. The self is not a given instance, but an effect of inseparable system coherence in the brain, which cannot objectify itself because it is not an object, but a structural state. In the collapse model, what Zahavi calls prereflexive is precisely the condition in which reflection becomes possible in the first place – as a secondary operation on a system that can no longer be dissected in its own functionality.

This shows that the pre-reflexive self is not a final instance either, but an expression of a deeper structural state that is neither reflexively nor intentionally grounded, but functionally emerges. There remains a difference to phenomenology: While Zahavi remains at the level of subjective givenness, the collapse model asks about the condition of the possibility of this givenness in the sense of causal system structure.

What Zahavi describes as pre-reflective self-consciousness corresponds structurally to what is understood in the collapse model as the systemic inseparability of the experiencing individual. The difference lies not in the phenomenon, but in the way it is described: Zahavi sticks to the

phenomenological given, while the collapse model seeks to reconstruct it structurally and systemically.

However, it should be noted that causal collapse is not just an abstract system principle. It has a concrete biological anchoring in the causal nucleus of the eukaryotic cell, which has become the functional center of organismic organization in evolution. In this sense, the nucleus – systemically speaking – forms the earliest reference point of an internal structure that organizes, regulates and stabilizes itself.

This causal core is not a homunculus and not an ego in the metaphysical sense. But from a biological and functional point of view, it is a necessary prerequisite for a form of self-reference – in the sense of an ego – to develop at all. In this respect, it would not only be an explanatory unit, but actually an **existential constitutional condition**: the systemic center on which everything else is built. The ego then appears not as a transcendental subject, but as a historical-evolutionary emergent phenomenon that emerges from a structural center – a center that is neither psychological nor consciousness-based, but functional and stabilizing.

6. Structural theory of causal collapse

The theory describes consciousness as the state of a system in which a pre-existing differentiation of causal units can no longer be maintained. In the context of the brain, this means that a large number of functionally specialized neuronal subsystems – sensory, motor, integrative, affective – initially operate in a partially decoupled manner. However, recursive feedback, convergent stimulation and increasing interdependence create a point at which none of these units can be causally described independently of the others. The system is then in a state of structural inseparability.

Neurobiologically, various correlates can be discussed. The integration of cortical activity patterns, especially via thalamo-cortical loops, plays a central role, enabling functional synchronization over wide areas. Studies on synchronized gamma activity (Singer, Varela) indicate that conscious states are always associated with high functional coherence between distributed regions. In this context, the concept of collapse describes not only coherence, but the transition from partial to total functional dependence – a tipping point of causal differentiability.

This state is not static, but dynamic: the collapse can be maintained, become unstable, or collapse (e.g., due to sleep, anesthesia, or pathological conditions). What is decisive is that only in a state of collapse does that density of integration exist that enables a subjective perspective in the sense of an experience that cannot be further resolved. Consciousness is thus not a continuous process, but an emergent state within functionally networked systems, which is characterized by the loss of analytical separability.

7. Empirical Notes on the Collapse Model

The model of causal collapse can not only be justified theoretically and systemically, but can also be plausibly verified by a large number of empirical findings (Stegemann 2025b). Studies from consciousness research show that conscious states are associated with increased functional integration and synchronous activity in widely distributed networks of the brain. A central empirical paradigm in this context is the study of changes in consciousness due to anesthesia, sleep, or epileptic seizures.

For example, studies with EEG and fMRI show that in unconscious states (e.g., deep sleep, anesthesia), the large-scale synchronization of cortical activity decreases sharply. Instead, local oscillations dominate, which are no longer embedded in an overarching functional network. In the awakened state, on the other hand, increased connectivity between different cortical and subcortical regions can be observed (see e.g. Tononi, Koch, Laureys).

Another empirical field concerns so-called split-brain patients, in whom the severing of the corpus callosum creates two largely independent processing streams in the brain. In such cases, complete consciousness seems to be linked to the maintenance of global integration – its absence does not lead to complete unconsciousness, but it does lead to a fragmentation of experience that is compatible with the collapse model: only the state of global inseparability produces full subjective coherence.

There is also support in research on psychedelic states and minimal consciousness (e.g., vegetative state): where the integration of complex networks is disrupted or overly amplified, qualitative features of the experience shift. The state of collapse marks an unstable point of maximum integration – a transitional area between functional consciousness and its disappearance.

These empirical indications cannot prove the collapse model, but they can support its basic assumption: consciousness is bound to a specific structural state that can be characterized by the loss of causal separability within a networked, dynamic system.

8. Foundations of System Theory

The collapse model is not only neurobiologically and empirically compatible, but also has a clear anchoring in systems theory. The starting point is the assumption that living systems are characterized by **self-reference, recursiveness and operational coherence** . In this perspective, a system is defined not by the fact that it consists of parts, but by the fact that it operates via **internal rules** that dynamically maintain its structure – an idea that goes back to Maturana and Varela (autopoietic systems) and Luhmann (social systems).

A central element of such systems is the tendency towards the formation **of nonlinear states** in which a qualitative transshipment point is achieved through feedback and interdependence. In this context, *causal collapse* is to be understood as precisely such a turning point: the moment in which functional differentiation through internal recursion passes into a stage in which no separate causes can be identified – because every change in the system is both an effect and a condition of other changes.

In the language of systems theory, one could say: Collapse is not a failure of separation, but a **functioning of a higher order**. It does not mean chaos, but self-closure. This makes it structurally identical to what is referred to in autopoietic theories as a systemic context of meaning or a re-entry process.

This perspective shows that the collapse model does not stand outside theoretical paradigms, but can be precisely communicated with established system-theoretical concepts. Collapse does not merely describe a neurophysiological phenomenon, but a **general property of complex, self-referential systems** that structurally permeates biological as well as cognitive or social phenomena (Stegemann 2025c).

9. Evolutionary anchoring of the collapse model

The model of causal collapse is not only found in the brains of current organisms, but also has its deeper roots in the evolutionary origin of complex life forms. The causal nucleus is not just a metaphor here, but can be concretely biologically grasped – for example in the eukaryotic cell nucleus. This is the first stable center of functional self-coordination within a cell, enabling internal regulation, replication and information processing.

In the evolution of complex organisms, the cell nucleus represents a structural precursor to the integration that leads to conscious coherence in the brain. It is the prerequisite for the formation of a hierarchically and functionally differentiated overall system – a place where structural instability does not lead to disintegration, but to self-organization. The principle of collapse – the loss of separable causality in favor of systemic inseparability – is thus already inherent at the cellular level.

In this sense, causal collapse is not only a description of current consciousness processes, but an **evolutionary structural principle**. It repeats itself at different levels: in the cell nucleus, in the nerve network, in the brain. What changes is the complexity, not the basic pattern. The collapse thus becomes the **common thread of a biological self-entanglement**, which ultimately leads to the possibility of a first-person perspective and an experiential world.

10. From Causal Core to Causal Collapse: Two Structural Principles of Integration

Here we would like to refer again to the connection between the so-called causal core and the causal collapse. Both terms describe structural states of systemic integration – but they belong to different levels of explanation and must not be confused with each other or equated in a shortened form.

The **causal nucleus** is an **evolutionary structural principle** (Stegemann 2024). He describes the earliest physical-organizational mechanism in living systems that arises from asymmetric environmental influence. Even in simple cells, imbalances in exchange with the environment create an internal hotspot of reactive stabilization – a region in which stimulus processing, regulation and control converge. This hotspot consolidates via feedback to a functional center, which is finally realized in a biologically tangible way in the **eukaryotic cell nucleus** . The causal nucleus is thus **not neuronal**, but a **systemic early form of integrative organization**. It is physically explainable, biologically verifiable, and forms the basis of every higher self-organization in the life process.

Causal collapse, on the other hand, is a **specific neuronal structural principle** that only occurs in the highly developed brains of complex organisms. It describes the state of functional inseparability that arises when specialized neuronal subsystems are fed back to each other in such a way that they can no longer be independently causally described. In this state, not only a systemic coherence emerges, but an **epistemic inner perspective** – the possibility that the world, the self and experience appear as a coherent unity.

The relationship between the causal nucleus and the collapse is **thus not identical**, but **developmentally complementary**:

- The causal core forms the **basis**: a physical-biological principle that enables functional centering and self-regulation.
- Causal collapse is a **higher form of realization** of this principle at the neuronal level, with the specific effect that **consciousness can arise** as an epistemic entity.

The two principles are not ontologically different, but they are functionally differentiated. One concerns **life** as such, the other **consciousness** as a special case of neuronal organization. The collapse is thus a dynamic intensification of the systemic core – not mere continuation, but qualitative emergence. It is the point at which structure tilts: from the biological center to the epistemic perspective.

11. Dealing with phenomenological counter-arguments

A possible objection from the phenomenological tradition could be that the collapse model reduces the experience of consciousness to a functional structure and thus loses what constitutes phenomenology – the first-person reality of the world, the concrete bodily being-in-the-world. Husserlians might object that any objective description is necessarily secondary to the original fact of intentional consciousness.

This must be countered by the fact that the collapse model **does not negate** the first-person perspective, but **embeds it structurally**. It does not claim that the subjective given is "illusory", but that it **is only possible at all in a certain systemic state** – namely where functional differentiation turns into a form of maximum integration. In this respect, the model is not a reduction, but a structural explanation of **how** subjective unity can emerge.

A representative of bodily phenomenology could further object that consciousness cannot be localized in the brain because it takes place in bodily movement, in embodied relationship to the world. But here, too, the collapse model can answer: it does not locate experience in the narrower sense, but the **condition of the possibility of coherent self-relations** – not as a place, but as a state. The body remains relevant, but not constitutive. It provides input, context, resonance – but not the causal structure that carries consciousness as an inseparable unit.

Finally, an approach like Zahavi's could emphasize that the "self" lies before any functional structure – as a pre-reflexive given. But this is exactly what is reinterpreted in the collapse model: this fact is not ontologically presupposed, but **the result of a structural self-commitment**. The state of collapse is the only one in which something like "unavoidable self-presence" can occur systemically at all – and precisely for this reason it appears to reflection as original.

12. Epistemological Primacy and the Limits of Phenomenology

The collapse model represented here is methodologically closer to Husserl than to his phenomenological successors. For it shares a central conviction with Husserl: every cognition begins in the perspective of the first person, not because it is subjective or empirical-introspective, but because it represents the **epistemic condition** of every worldview (Stegemann 2025d). This epistemological orientation distinguishes Husserl from Merleau-Ponty, Heidegger or Zahavi, whose works are increasingly ontological, existential or anthropologically motivated.

In contrast to Husserl, however, the position represented here does **not presuppose a transcendental ego**. The epistemic perspective is not guaranteed by a subject, but by a **structural asymmetry** that results from the system state of causal collapse. This marks the point of functional density and inseparable interdependence in which an epistemic center, a coherent perspective on the world, can develop in the first place.

Husserl's phenomenology is a methodologically necessary precursor of the collapse model insofar as it theoretically rehabilitates the first-person perspective and defends it against naturalistic reductions. But it stops at the level of description. The collapse model goes beyond this: it explains **why** this perspective arises, **how** it is structurally possible, and **when** it collapses.

In this respect, the model combines Husserl's epistemological claim with a systemic and biological depth dimension. It shows that the first-person experience of the world is not a metaphysical fact, but the result of a physically stabilized, dynamically complex state – which is at once necessary, fleeting, and explainable.

13. The epistemic primacy: Criticism of corporeality and 4E approaches

In the current debate on consciousness, it is often argued that access to the world is not possible without corporeality. This position can be found both in the phenomenological tradition (especially in Merleau-Ponty) and in the cognitive science concepts of the so-called 4E perspective (embodied, embedded, enactive, extended cognition). Both argue that consciousness, perception and reference to the world can only be explained by an experience and action embedded in the body.

Typically, it is asserted that sensory stimuli, body movement and situational embedding are constitutive of reference to the world. Without sensory coupling to a mobile organism – so the argument goes – no coherent experience can come about. The reference to deprivation phenomena (e.g. Kaspar Hauser syndrome) often serves as an empirical argument: a brain without bodily stimuli would remain isolated, lacking in information, and developmentally inhibited.

However, the collapse model advocated here contradicts this argumentation on a crucial point: it does not deny the role of the body as an input and resonance structure, but it does dispute its **constitutive epistemic status**. The body is a condition for the formation of certain stimulus patterns and orientation relations – but **not** the instance through which coherent access to the world emerges. The corporeality is a functional disposition, not an **epistemological structural condition**.

Access to the world in the strict sense – as a structured, experiential, meaningful unit – arises solely from the system state in which neuronal subsystems no longer operate independently of each other, but are functionally inseparably entangled. It is only this **causal collapse** that creates the epistemic perspective that makes an experience possible in the first place. Corporeality is thus not the origin of experience, but the operative context for the emergence of those structural states in which experience takes place.

In this respect, the 4E approaches remain secondary: they describe conditions of action and environmental interaction, but not the structural facilitation of reference to the world. They explain *how* an organism acts, but not *why* an experiential world appears in the first place. It is precisely this difference between functional embedding and epistemic structure that is crucial – and is made explicit in the collapse model.

14. Synthetic Outlook: Collapse as a Bridge Concept

The previous discussions show that the concept of causal collapse allows classical and modern phenomenological insights to be grasped in a new way – without having to rely on a transcendental subject structure, on corporeality or on a pre-reflective self as an original given.

The collapse is not a metaphysical positing, but describes an empirically and theoretically accessible system state in which subjective unity, self-relationship and consciousness structure arise at the same time. It is therefore **an integrative term** that:

- the phenomenological perspective of the 1st person (experience, inseparability, givenness),
- the empirical perspective of the 3rd person (system structure, neurobiological conditions),
- as well as the evolutionary perspective (causal nucleus as a condition of origin)

in a consistent model.

Compared to Husserl, the collapse replaces the transcendental ego with a functional integration achievement. In contrast to Merleau-Ponty, he replaces the body as the basis of experience with the systemic constellation of the brain. In contrast to Waldenfels, he replaces the foreign as origin with internal structural instability. And in relation to Zahavi, he replaces the pre-reflective self with the condition of the possibility of such self-givenness.

In all cases, it becomes apparent that consciousness is not simply there – it **arises**, **collapses** into an inseparable unity, the boundary of which is not introspective, but systemically determined. Collapse thus becomes a **bridging concept** that can be made not only explanatory, but also transdisciplinary – between philosophy, neurobiology, psychology and systems theory.

This means that nothing less than a new beginning is at stake: not the ego as a subject, but collapse as a structure – not consciousness as a given, but as the structural state of a self-closing system.

The phenomenological project is not replaced, but placed on a new, systemic-empirically sound basis.

Epilogue 15: From Phenomenological Description to Systemic Explanation

The model of causal collapse is not understood as a refutation of phenomenological positions, but as their transformation into a structural theory based on systems theory and biology. It takes the phenomenological insights seriously – in particular the inevitability of the first person, the unity of experience and the inseparability of self-reference and the world – but detaches them from their intentional and subject-based framing and reconstructs them as dynamic system states.

In this sense, collapse is not only a neurofunctional event, but an **epistemically grounded constellation**: it explains the conditions under which a coherent experiential space arises in the first place – without having to resort to a transcendental subject, bodily being-in-the-world structures or pre-reflective conditions. Subjectivity does not appear as a prerequisite, but as an effect of a structural transition – emergent from a configuration of maximum internal causal networking.

The collapse model thus offers a transdisciplinary bridge: it combines consciousness research, systems theory, neurobiology and basic epistemological questions in a coherent frame of reference. It is not the subject that is at the center, but the state that makes subjectivity possible. It is not consciousness that is explained, but the **condition of its possibility**. This perspective shows that it is not the human being as a metaphysical being, but the **system as a self-organizing structure** that is the bearer of a relationship to the world.

Appendix: Comparison of phenomenological and systemic perspectives

Concept	Phenomenological Tradition	Collapse model (systemic)
Subject / I	Transcendental instance (Husserl), physically situated (Merleau-Ponty)	Structural state, emergent from functional integration in the brain
Self-confidence	Prereflexive self-givenness (Zahavi)	Non-objectivity as an effect of collapse
Body	Constitutive condition of the reference to the world	Input structure, non-constitutive – context, not reason
Access to the World	Intentionality; being-in-the-world; Call of the Stranger (Waldenfels)	Epistemic effect of structural inseparability
Consciousness	Unity of experience, intentionally structured	Emergence from maximum functional integration
Strangeness / Alterity	Originally constituent	Result of cognitive differentiation in the system
Cognition	First person, intentional execution	Systemically based perspectivity from asymmetrical self-commitment
Constitutional authority	Subjective Experience, Ego Structure	Causal collapse as a functional transshipment point

Bibliography

- Husserl, Edmund: *Ideas on a pure phenomenology and phenomenological philosophy. Erstes Buch*, Halle: Niemeyer 1913.
- Husserl, Edmund: *Lectures on the Phenomenology of the Inner Consciousness of Time*, ed. by M. Heidegger, Halle: Niemeyer 1928.
- Koch, Christof (2004): The Quest for Consciousness: A Neurobiological Approach. Englewood: Roberts & Company.

- Laureys, Steven; Owen, Adrian M.; Schiff, Nicholas D. (2004): Brain function in coma, vegetative state, and related disorders. The Lancet Neurology, 3(9), 537–546. https://doi.org/10.1016/S1474-4422(04)00852-X
- Merleau-Ponty, Maurice: *Phenomenology of Perception*, Berlin: de Gruyter 1966 (French Orig. 1945).
- Singer, Wolf (1999): Neuronal synchrony: A versatile code for the definition of relations? Neuron, 24(1), 49–65.
- Stegemann, Wolfgang (2025a). An Expedition to the Center of Consciousness. https://doi.org/10.5281/zenodo.15436189
- Stegemann, Wolfgang (2025b). Consciousness - Expanding the Model of Causal Collapse. https://doi.org/10.5281/zenodo.15351381
- Stegemann, Wolfgang (2025c). Integrated model of causal collapse. https://doi.org/10.5281/zenodo.15350050
- Stegemann, Wolfgang (2025d). *Epistemic Phenomenology. https://medium.com/p/294cc5ace41f*
- Stegemann, Wolfgang (2024). From Autocatalytic Systems to Bayesian Behavior. https://medium.com/p/ba4a0dcf6873
- Tononi, Giulio (2004): An information integration theory of consciousness. BMC Neuroscience, 5(1), 42 https://doi.org/10.1186/1471-2202-5-42
- Varela, Francisco J., Lachaux, Jean-Philippe, Rodriguez, Eugenio, Martinerie, Jacques (2001): The brainweb: Phase synchronization and large-scale integration. Nature Reviews Neuroscience, 2(4), 229–239.
- Waldenfels, Bernhard: *Topographie des Fremden*, Frankfurt/M.: Suhrkamp 1997.
- Zahavi, Dan: *Self-Awareness and Alterity*, Evanston: Northwestern University Press 1999.
- Zahavi, Dan: *Subjectivity and Selfhood*, Cambridge: MIT Press 2005.