Chapter 17
Narrative and Cognitive Modelling: Insights from Beckett Exploring Mind's Complexity

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Abstract Complex systems exacerbate a common problem for scientific enquiry: the difficulty of creating models able to discriminate fundamental elements or patterns from random behaviours or corollary components in the event or process at issue. This chapter argues that a similar tension between order and randomness has been a chief modelling problem of Samuel Beckett's narratives, tied to his interest in a specific kind of complex system (the mind) and its emergent properties (consciousness and the narrative sense of self). Bulding on narratology, complex system frameworks, cognitive theories of emergence and of scientific modelling, this chapter introduces the idea of "fictional cognitive modelling". Through this concept, the chapter analyses Beckett's treatment of narrative devices as formal tools for the creation of "exploratory models" able to atomise the emerging unity of conscious experience and of a narrative sense of self into its core components (defined as the "narrative dynamic core"). It concludes by suggesting that Beckett's narrative method shows how literature can occupy a proper position in the investigation and exploration of complex systems.

1 Modelling the Mind as a Complex System

Complex systems, despite their exceptionality, reiterate and exacerbate what is a common problem for scientific enquiry: the difficulty of creating models able to discriminate fundamental elements or patterns from random behaviours or corollary components in the event or process at issue. As James Crutchfield notes, "a key modelling dichotomy that runs throughout all of science is that between order and randomness" (2008, p. 273). In complex systems, this dichotomy is brought to the utmost limit given that randomness dominates and patterns often eschew the simplifying nature of modelling. In this respect, the resistance that complex systems pose to narrative can be regarded as one specific subset of a more general difficulty:

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to capture complexity with formal devices. Insofar as the stake is epistemic, it is hard to gauge how much we lose of the actual dynamics of complex systems when trying to make them fit formal models—narrative structures included. As Richard Walsh neatly states in this volume (Chap. 5), "there is an important gap between our narrative talk of what a system does and how system actually does it". The same holds true, with some provisos, for the gap between scientific modelling and the modelled systems. Despite the significant divide between scientific and narrative approaches to complexity that is the very object of this volume, a shared common ground can therefore be found in the question of how we can model a (narrative) form to accommodate the chaotic behaviour of complex system and their emergent properties.

A similar question was the chief formal concern of Samuel Beckett's work throughout his career. As is famously reported, he explained in an interview with Tom Driver in 1961 that he felt that the only viable task for art was "to find a form to accommodate the mess" (Driver 1979, p. 219). This chapter argues that for Beckett this was a proper problem of modelling dichotomy tied to his interest in a specific kind of complex system (the mind) and its emergent properties (consciousness and the narrative sense of self). Within contemporary cognitive science and philosophy of mind, it is increasingly suggested that the brain should be regarded as a complex system (Gazzaniga 2012). Whether the mind and its mental properties, including consciousness and a sense of selfhood, can be interpreted through the conceptual lens of complex system theory is still a matter of debate (Vision 2011; Bedau and Humphreys 2008; Macdonald and Macdonald 2010). As it is beyond the scope of this essay to enter the controversy, I build exclusively on cognitive strands of research taking consciousness and the sense of selfhood as emergent patterns of the mind viewed as a complex system. An implicit ground of my argument, though, is that if what are called "neural correlates" of mental states exist at the brain level, human beings cannot access (narratively or not) their complex interaction. Conversely, a sustained training in introspective techniques (Hurlburt and Heavey 2001) can let us glimpse the complexity of the mental counterpart of the neural activity—the distinct and chaotically interacting components (e.g., language, time-consciousness, memory, agency, imagination), working at the edge of their emergent global coordination that gives rise to our unified feeling of being conscious and being ourselves. Modernist writers such as Beckett, as Dorrit Cohn pointed out, were arguably great introspectors (Cohn 1978, p. 89), and the phenomenal data they gathered can therefore have provided insights for deriving narrative modes (and models) of exploration into what underlies or lies beyond our (to an important extent narratively) unified feeling of subjective experience.

This unified feeling, either scientifically or introspectively, is hard to unpack into its components, and this is taken as a positive sign of its emergent nature. As Basset and Gazzaniga note, "although the material components of the physical brain might be highly decomposable, mental properties seem to be fundamentally indivisible" (2011, p. 5). Here, I suggest that Beckett was able to atomise the constantly emerging unity of conscious experience into its core components, interacting and integrating at the level of mind's complexity. He reached this difficult goal, I argue, by treating

narrative elements, devices and structures as formal tools for his modelling strategy that I call *fictional cognitive modelling*. Importantly, to the extent that the unified experience of selfhood is partly the result of a narrative dynamic, Beckett's modelling of the mind as a complex system leads to and calls for a new definition of narrative (which I attempt in Sect. 4) as an emergent property resulting from the complex interaction of many levels and elements, such as those Beckett incorporates in his models.

In Sect. 2, I start by elaborating further on the problematic modelling dichotomy between order and chaos in Beckett's work. In Sect. 3, I present some preliminary arguments for why Beckett's prose overcomes the limitation usually linked to a narrative understanding of complexity. In Sect. 4, I introduce contemporary definitions of the mind as a complex system and of consciousness and the self as its emergent properties. I also elaborate on the idea that our narrative sense of self is the emergent outcome of key different components (which I call the *narrative dynamic core*) within the mind's complexity. In Sect. 5, I expand on the idea of the narrative dynamic core, by finally showing how it has been either locally or globally modelled in specific texts. In the conclusion, I argue that looking at Beckett's use of narrative as a modelling strategy can help reposition the literature as a field of exploration into mind's complexity.

2 Narrative Chaotics and the Aboutness of Complexity

In the transcript of the already mentioned interview in 1961, Tom Driver, Professor of Literature and Theology, reports how Beckett "began to speak about the tension in art between the mess and form. Until recently, art has withstood the pressure of chaotic things" (Driver 1979, p. 219). Driver then poses a question that is highly relevant to the modelling dichotomy between complexity and its formal accommodation: "How could the mess be admitted", Driver inquires, "because it appears to be the very opposite of form and therefore destructive of the very thing that art holds itself to be" (p. 219). Translating the question into the complex system terminology, the problem becomes how can narrative form approximate complexity given the (temporal, linguistic, sequential, linear) structuring nature of the former that seems refractory to chaotic behaviours? Beckett's answer is that artistic form should not "exist as a problem separate from the material it accommodates" (p. 219). More than thirty years earlier, Beckett had already formulated his stance about the necessary conflation of content and form, identifying in the writing of James Joyce the landmark example of a literary narrative where "form *is* content, content *is* form"—notoriously claiming that "his writing is not *about* something*; it is that something itself*" (Beckett 1984, p. 27). In Beckett's terms, the modelling dichotomy occurring when (narratively) tackling complexity can be redefined as how to go beyond the *aboutness* of complex systems.

In her study on what she labels "narrative chaotics", Jo Alyson Parker (2007) addresses a similar issue. She takes the lead from a 1996 article by Steven Johnson in

which he restricts the possibility of literary narrative to the *aboutness* of complex systems. In this article, Johnson explains how, in his opinion, novels "may be *about* complex systems (cities, economies, ecosystems, and so on) and they are certainly the *products* of complex systems (the neural nets of the human mind), but they themselves are language-based, static, dictated from the outside. . ." (Johnson 1996, p. 47). Parker's objection is that the narrative works of Proust, Sterne, Woolf and Faulkner have "certain narrative structures [which] resemble chaotic nonlinear dynamical systems" and therefore can be classed as examples of "narrative chaotics" (Parker 2007, p. 21). I am very sympathetic with Parker's perceptive use of the complex system's toolbox for literary analysis. My concern here, however, is not to analyse Beckett's narrative works *as* complex systems themselves, but as *models of* the mind as a complex system. This said, the problem of the *aboutness* remains, and it is even more crucial. How can narratives targeting complexity do so without either merely representing complex systems (the *aboutness*) or becoming themselves complex systems (*narrative chaotics*)? Once again, this is a modelling dilemma and, as happens with scientific modelling, either by becoming as complex as the actual process or by distancing themselves too much towards an oversimplification of the process, narrative models can become useless.

Models of a process, in fact, never equal the process itself, but are formal simplifications enabling different kinds of analysis. As Lewandosky and Farrell synthesize in their comprehensive book on cognitive models, at its most basic "a model is an abstract structure that captures structure in the data" (2011, p. 10). This structural relation between models and processes can be directed at different scopes—descriptive, predictive, explanatory or exploratory. I return to this in the conclusion to consider how Beckett's work can be understood in relation to this variety of models. For now, it is enough to say that a model's structural relation with a process is more than mere *aboutness* and less than full identity. Thanks to the model, structures can be perceived (or hypothesized), patterns explored, processes characterized in terms of key components. It is worth repeating, though, that, as Lewandosky and Farrell constantly stress, "models are intended to be simpler and more abstract versions of the system—in our case human cognition—they are trying to explain . . . Models seek to *retain the essential features of the system* while discarding uneccessary details. By definition, the complexity of models will thus never match the complexity of human cognition—nor should it, because there is no point in replacing one thing we do not understand with another" (2011, p. 11; italics mine).

With Beckett, however, it would be hard to maintain that his narrative modelling of mind's complexity has been driven by a belief in the possibility of better understanding its cognitive underpinnings. Quite on the contrary, he repeatedly insisted on the importance of accepting our ignorance about the complex chaotic behaviour of the inside and outside worlds. Given that our mind *is* a complex system itself, how can we aspire to reach an understanding of its functioning from within? As Beckett makes clear in a letter to George Duthuit in 1949, since we are enmeshed in complexity, "being in it discourages you from knowing it" (Beckett 2011, p. 131). In a similar vein, in another letter to Duthuit one year before, Beckett harshly

comments on the geometrical painting technique of Antonello da Messina's St Sebastian—"pure space by dint of mathematics"—caustically concluding how "[i]n front of such a work, such *a victory over the reality of disorder*, over the pettiness of the heart and the mind, it is hard not to go and hang yourself" (Beckett 2011; italics mine). Beckett's distrust in formal means of understanding reality, of ordering its chaotic behaviour, starkly contrasts with his precocious and sustained interest in mathematics (Ackerley 1998), physics (notably thermodynamics and the idea of entropy; Duffy 2013; Harrington 1982), and science in general (Ackerley 2010), an interest that is undeniably mirrored in the formal qualities of his narrative work. The modelling dichotomy between randomness and order is therefore reflected once more in the tension between Beckett's emphasis on the chaotic nature of reality and the formal features of his narratives. As Chris Ackerley observes, while charting Beckett's interest in scientific ideas and problems, "any attempt . . . to saddle Beckett with a scientific temperament, let alone a scientific methodology, runs into an impasse generated by Beckett's deep distrust of the rational process" (Ackerley 2010, p. 144).

My answer to this paradoxical tension is that, with respect to the mind's complexity, Beckett employed a formal, highly sophisticated modelling strategy in order to approach, disclose, and let the reader perceive the complex chaotic behaviour lying *beyond and before* the emergent unifying dynamic of conscious experience. What I call Beckett's *fictional cognitive modelling* of the mind's complexity can therefore be described as a formal "exploration" (a term that I return to in the conclusion of the essay) of the key components responsible for the emergent *feeling of order* in our subjective experience. As we see in the next sections, that unifying feeling is to a significant extent a narrative emergent outcome of complex interactions at the level of the mind's complexity. As such, our narrative sense of selfhood it is *an emergent property that conceals its complex origins*.

3 Beyond and Before Emergence: Experiential Art and Narratives of Centralised Control

The narrative we tell about ourselves as a unified, integrated, single, temporally consistent and causally coherent centre of experience is a specific case (we could even say the "cognitive matrix" of) what Porter Abbott defined, in his landmark article on the limits of narrative understanding of emergent behaviour, the "narrative of centralized control" (Abbott 2008, p. 231). To recapitulate the key points in Abbott's article, he suggests that there is an "incompatibility of emergent behaviour with narrative understanding" due to the "massive distribution of causal agents" (p. 227) of the former. Abbott clearly concedes that we are able to manage a certain degree of causal complexity in literary and real life narratives. Yet he proposes that, as soon as complexity increases such as in complex systems, our coping strategy is to project a "default narrative of centralised control" (p. 236) in order to explain

emergent behaviour. This does not mean that we cannot narratively describe the perceptible *effects* of emergent behaviour in complex systems. We can, for instance, narratively report the story of the aerial ballet performed by a flock of birds, Abbott says; but we do so "without any reference to the emergent process that bring them into being" (p. 236). When it comes to emergent patterns and behaviours, Abbott concludes, we face a "void of unnarratibility" (p. 236) to which we respond with illusory narratives of centralised control. In other words, we are narratively stuck in the *aboutness* of complexity, of which this class of narrative provides only *a feeling of* understanding, with neither access to the actual components of the system nor to the emergent transition that leads to emergent behaviour.

Interestingly, Abbott is a foremost scholar of Beckett, whose work seems to provide a challenging counterexample to Abbott's argument insofar as it entirely resists narratives of centralised control. This resistance has to be intended both as a resistance on the part of Beckett to create centralised narratives and as a consequential impossibility for the reader to project this default narrative mode of understanding. In his more recent monograph, significantly titled *Real Mysteries: Narrative and the Unknowable*, Abbott points in this direction by classing Beckett's work as "reader-resistant" narratives, which give us "experiential knowledge of our ignorance about who we are" (Abbott 2014, p. 40). As much as I endorse Abbott's idea of Beckett's work as a "reader-resistant" narrative (a narrative opacity that, importantly, Abbott previously assigned to complex systems), my argument is that this resistance is a positive result of Beckett's modelling strategy of the mind's complexity. It is precisely because he has been able to disassemble the emergent narrative sense of self (the cognitive matrix of all narrative of centralised control) into its key components (which I address in the next two sections)—interacting and operating at the level of the mind's complexity—that we can experience what lies beyond and before this unified emergent level.

The feeling of ignorance of which Abbott speaks is due to the fact that Beckett's work presents the key components of mind's complexity *in the process of interaction*, before and beyond their emergent narrative outcome. In doing so, he models the very cognitive processes resulting in the emergent matrix of centralised control that gives us a (partly narrative) feeling of order about experience. This is why our default mode of narrative understanding fails when we encounter Beckett's work. Expecting, as readers, to be able to make sense of the events by projecting a narrative thread, we face instead the key components of our narrative understanding. If we do not recognise these components as part of our experience it is because their interaction usually goes on unperceived. In a way, our habit to succeed in casting narrative threads upon events is a precondition for Beckett's fictional cognitive models to work. It is the failure of our narrative habit that allows us to experience Beckett's narrative models as something new—something located at the level of the mind's complex interactions, which precedes (and *therefore* resists) the narrative grasp of our everyday inner experience.

Beckett's cognitive models complicate Lewandosky and Farrell's definition according to which models "retain the essential features of the system", insofar as they retain the features of the cognitive system that *at the same time they target and*

are shaped by: the human mind's complex components. Put in Beckett's terms, we can say of his narrative work what he positively noted about the work of his friend and painter Avigdor Arika. When trying to explore the complex inner relations amongst the mind's components, "in his work, these intimate relations retain the specific character of the frame within which they are formed" (Beckett 2011, p. 84). To the question of how a writer can internally access these inner relations, operating before and beyond the emergent narrative that unifies and conceals their complexity, my answer is "simply" by introspecting. The limits of introspective methods have been repeatedly pointed out throughout the history of psychological and cognitive research (Butler 2013; Hurlburt and Schwitzgebel 2007). My contention is that Beckett's fictional cognitive modelling shows how narrative devices can be turned into tools for overcoming the limitations of a narrative introspective report of inner experience. And even more when it comes to modelling the elements responsible for the emergence of a narrative sense of self, which is the matrix of our everyday narrative understanding.

Together with armchair introspection, in fact, it is by the very process of creating narrative worlds (which is the novelist's business) that they can gather information about the key elements by which a narrative is formed, our narrative sense of self included. The gathered information could then be turned into a model which, more *and* less than in an analogy, retains the features of the cognitive process it addresses. As Alva Noë points out in his enactivist study on perception, "[i]t is not pictures *as* objects of perception that can teach us about perceiving; rather, it is *making pictures*—that is, the skillful construction of pictures—that can illuminate experience itself, or rather, the making or enacting of experience" (Noë 2004, p. 179). Similarly, in order to access the complex making of our narrative sense of self that is usually an emergent process transparent to us, we should not look at its products (narratives of aboutness), but rather enact the emergent process of its creation. And given the functional similarity between cognitive and literary storytelling, writers are extremely well-placed to provide insights and fictional models for exploring the complex nature of narrative emergences. Alva Noë briefly gestures at a possible role of art in accessing aspects of experience usually transparent to us—in our case the emergent unifying activity through which our (richly narrative) conscious experience is shaped. The task of this kind of art, that Noë calls "experiential art", is "not so much to depict or represent or describe experience, but rather *to catch experience in the act of making the world available* ... The aim of experiential art and phenomenology ought to be ... to draw attention to an activity that, by dint of the fact that we can perceive, we are very good at it" (p. 177; italics mine). In spite of our being very good at and accustomed to narrating our story to ourselves and to others, however, we are usually blind to the complexity underlying this process. This is why we need experiential art, to draw attention to this activity in order to catch the process in the making. Once we have captured the key elements of the process, its modelling can be a further step, enabling a more formal exploration of its hidden complex interactions, which is exactly what I maintain Beckett achieved in his narrative work. To better grasp the structures and elements of Beckett's fictional cognitive models, we first need a more complex definition of the processes his models are investigating.

4 A Complex Definition of Mind, Narrative and the Narrative Sense of Self

The path leading from brain activity to our subjective experience and mental states is intricate, mysterious and full of gaps in our understanding of it. How can physical interactions at the neuronal level generate mental states? This question has been (pre) occupying philosophers of mind and cognitive scientists for centuries. The problem, which harks back to Plato, found a solution (today harshly criticised) in the Cartesian dualistic view of a split between the body (*res extensa*) and the mind (*res cogitans*), which Joseph Levine more recently labelled the "explanatory gap" (Levine 1983). The inexplicability of this gap is plainly illustrated in a passage from Beckett's novel *Murphy*, in which the homonymous protagonist indulges in the pleasure of introspection: "[t]hus Murphy felt himself split in two, a body and a mind. They had intercourse apparently, otherwise he could not have known that they had anything in common. But he felt his mind bodytight and did not understand through what channel the intercourse was effected nor how the two experiences came to overlap. He was satisfied that neither followed from the other" (2009b, p. 70). Today we know there is not a single "channel", like the Cartesian pineal gland, that can explain the transition from the physical to the mental. This kind of negative knowledge, however, does not cancel out the gap, which substantially remains to be explained.

One scientific way of proceeding is to look at *correlations* between our phenomenal conscious states and neural activity at the brain level. Tononi and Edelman pioneered this kind of approach to the explanatory gap by suggesting that "analyzing the convergence between … phenomenological and neural properties can yield valuable insights into the kinds of neural processes that can account for the corresponding properties of conscious experience" (1998, p. 1850). Their study corroborated the idea that "changes in a specific aspect of conscious experience correlate with changes in specific brain areas whether the experience is driven by external stimuli, by memory, or by imagery and dreams" (p. 1847). More specifically, they discovered that the unified nature of our conscious states is the result of a corresponding integration (that they call "functional clustering") of specific neuronal groups interacting at the level of the brain's complexity. They call this large cluster of neurons (which is not a fixed set, but nonetheless would usually include posterior corticothalamic regions), together constituting the unified neural process from which our conscious states emerge, the "dynamic core" of consciousness. The "dynamic core" is a functional cluster, a process of aggregation of key neural components whose complex global activity generates patterns that are the neural counterpart of our conscious states.

These findings are of great significance for understanding how neural complexity at the brain level gives rise to the emergent level of mental states. This said, as Philip Clayton points out, "if explanations are given exclusively in neurological terms, they will be by the nature of the case not able to specify what are the phenomenal experiences or *qualia* the subjects experience" (2004, p. 120). In other words, from the brain's complexity emerges the mind's complexity, a further level of

complexity that cannot be explained in neural terms. Importantly, the mind's complexity in turn can generate further emergences, from more primitive forms of awareness to higher order emergent phenomena such as our narrative sense of self. And at the emerged level of the mind's complexity, different kinds of clustering might occur, resulting from the interaction of a variety of components in our conscious experience. The question then becomes whether we can speak of a different "dynamic core" at the mind's level, from which higher orders of cognition emerge?

If literary narratives—engaging with and building on introspective enquires into, to quote Beckett's *Molloy*, "the laws of the mind" (Beckett 2009c, p. 9)—cannot access the neural complex level of conscious experience, they can approach (and, I argue, model) what lies beyond the unified emerged level of our subjectivity. The gap between the brain and the mind, in fact, is not just difficult to bridge, but it is also hard to graduate into a spectrum of multiple and successive emergences. What we usually think of as our fully-fledged indivisible subjectivity is in reality the last emergent state in a multi-leveled trajectory rooted in the brain and continuously generating new levels of complexity and subsequent emergences. From the brain's neural complexity more primitive states of mind emerge, with a minimal sense of ownership and agency of the organism that corresponds to what phenomenologists and cognitive scientists refer to as the "minimal self" (Gallagher 2000). This minimal sense of self is far from the high-order, conceptually rich feeling of subjectivity that we habitually experience as our self. On the other side, this minimal level of awareness is a necessary complex platform in which interactions of conscious states and components generate what Neisser has called the "extended self" (Neisser and Fivush 1994), Damasio the "autobiographical self" (Damasio 1998), or more broadly it is referred to as the "narrative self" (Schechtman 2011, 2007). This description of the trajectory from the brain to the fully-fledged self as a hierarchical chain of emergences fits with the account of emergence as a new macro-level of organization of previous micro-level elements. To borrow Gazzaniga's definition, "[e]mergence is when micro-level complex systems that are far from equilibrium (thus allowing for the amplification of random events) self-organize (creative, self-generated, adaptability-seeking behavior) into new structures, with new properties that previously did not exist, to form a new level of organization at the macro-level" (Gazzaniga 2012, p. 124). The autobiographical self can therefore be seen as the last level of organisation in a sequence of progressive emergences. This level cannot be accounted for in neural terms because, as Gazzaniga clarifies, "[t]he laws are not universal to all levels of organization; it depends which level of organization you are describing, and new rules apply when higher levels emerge" (p. 130). Logically, it might be useful to look at the components and elements interacting at the previous level in order to understand something of the emergent transition. In the case of the emergence of our narrative, extended, autobiographical self, we should therefore ask which kind of elements at the minimal-self level of complexity are triggering the transition? Building on Edelman and Tononi's hypothesis at the neural level, we can ask which elements constitute what I would call the "narrative dynamic core" in the mind's complexity, whose global activity generates our rich sense of subjectivity?

Narrative approaches to the self have been proliferating (for a survey see Schechtman 2011) and sometimes bitterly criticised (Strawson 2004) in the last few decades. Daniel Dennett famously suggested that the self is no more than a narrative abstraction, a "centre of narrative gravity" that we posit as the fictional source of the stories we tell *about* our self (1991). Similarly, Bayne has suggested that the self is a virtual centre of "phenomenal gravity", around which we build (partly narrative) representations of our self (2010, p. 289). An emergent approach to the narrative sense of self, however, is still missing. For this to happen, we should probably first look for a more complex definition of narrative as an emergent property itself. My argument is that Beckett's fictional cognitive modelling, by addressing the emergent transition from a minimal self to an autobiographical self, can help on both fronts. What I want to suggest is that Beckett, by introspectively looking beyond the surface of our narratively unified sense of self, has been able to identify and then model a possible "narrative dynamic core" from which our narrative self emerges. In our everyday acquaintance with the world and with ourselves we do not perceive the complexity underlying our unified experience, and we accept our rich subjectivity as the ground (and not the emergent outcome) of experience. Our mind's complexity is usually invisible to us, and we feel narratively unified into a self even if there is no single location in our brain or mind hosting it. Moreover, none of the interacting components generating our higher subjectivity are in themselves "selfy". As Owen Flanagan explains, "[to] be sure, there is no shadowy supervisor that is your CEO, and there is no nonshadowy central headquarters either. *You are a complex system*. Much of what makes you tick is neither "selfy" nor transparent from the subjective point of view" (Flanagan 1998, p. 210; italics mine). I want to suggest that Beckett's fictional cognitive models seem to aim precisely at exploring how non-selfy components in the mind are able to generate, by means of complex interaction, a narrative feeling of a temporally consistent and coherent self. My idea is that Beckett, building on introspective insights, appears to have singled out—a crucial moment in modelling—a restricted number of key components responsible for the emergence of a narrative self. This functional cluster, which I call the "narrative dynamic core", is, I argue, the main object of Beckett's fictional cognitive models. To anticipate the constitutive elements of the cognitive cluster that I explain in detail in the next section, I elaborate on the idea that Beckett modeled the construction of a narrative self as *the emergent property of the complex interaction between language, time, agents and imagination.*[1]

[1] As one of the reviewers of this essay rightly noted, a number of other authors (e.g., Proust) might be said to have 'singled out' these factors as crucial in the constitution of the Self and a variety of mental states. The originality of Beckett's manoeuvre, as the next section shows, consists rather in his 'modelling' strategy and method, i.e., in the creation of narratives *as models* (abstract, simplified forms that can be manipulated for different exploratory scopes).

5 The Narrative Dynamic Core and Kinds of Fictional Cognitive Models

To model the narrative self as an emergent process means to make hypotheses about the local elements (nodes) whose networking activity generates the self as an emergent pattern. As summed up by Evan Thompson's enactivist account of emergence—quoted by Mackenzie (2011)—"[a]n emergent process belongs to an ensemble or network of elements, arises spontaneously or self-organizes from the locally defined and globally constrained or controlled interactions of those elements, and *does not belong to a single element*" (Thompson 2007, p. 60; italics mine). In this perspective, the narrative self as an emergent process is therefore a distributed activity that cannot be identified with a single element in the system. In Varela's words, "what we call 'I' can be analysed as arising out of our recursive linguistic abilities and their unique capacity for self-description and narration" (Varela 1999, p. 61). The role of language, however, should not be overemphasized or isolated as the only element responsible for the emergence of a narrative self. The self is indeed partly a semiotic process (Pickering 1999), but language is only one of the elements involved in the complex networking activity through which the narrative self emerges. Furthermore, we can think of language itself in complex terms, as Lee et al. propose, considering it as a "multistrata of building blocks" or a "hierarchical structure of agents" in which "phonemes form syllables, which then form morphemes; morphemes form words, words form phrases, and the process continues, until we end up with speech acts, stories, and so on" (Lee et al. 2009, p. 21). As we will see in a moment, this idea that language itself might be disassembled into building blocks is the object of one kind of model in Beckett's work. Yet again, language is just one of the elements composing what I am defining as the "narrative dynamic core" that Beckett has singled out as the functional cluster generating our fully-fledged sense of self. And language alone is not enough for a narrative self to emerge. As already anticipated, the other elements that Beckett seems to have selected for and targeted in his models are time, agents and imagination. Let me cursorily outline each of these elements, before presenting concrete examples of Beckett's fictional modelling of cognition.

Firstly, language itself can take many forms within our cognitive commerce with the inner and outer worlds. It can be externally directed or internally and silently condensed in what cognitive psychologists have called "inner speech" (for a comprehensive survey see Alderson-Day and Fernyhough 2015). Since Beckett's models often portray a voice from within, and since many of his fictional worlds are isolated, closed-off mental spaces, inner speech in his work should be regarded as one of the more important aspects of language responsible for the emergence of a narrative self. Moreover, to support this choice, cognitive science is increasingly suggesting that inner speech has a fundamental role in the construction and monitoring of our self (Morin and Everett 1990).

Time is clearly also a key component in any type of narrative, the narrative of our self included. In human experience, however, we can distinguish two different types

of temporal cognitive processes. The first, more basic type concerns what is usually referred to in phenomenology, from Husserl onwards, as "time-consciousness". Time-consciousness is a micro-structure of our conscious experience which allows us to perceive temporally extended objects. It does not entail reflective or self-conscious thought about the temporality of experience at issue. Rather, it is a precondition of our phenomenal experience of the world, the necessary ground for perception to occur. As Gallagher and Zahavi explain, time-consciousness is a "temporal binding" (2010, p. 73), a "temporal synthesis [which] is a precondition for the perceptual synthesis" and which explains "how consciousness unifies itself across time" (p. 79). In other words, time-consciousness is the *a priori*, low-level condition thanks to which we are living in a flow of experiences as opposed to an experiential pointillism. Time-consciousness is also the precondition of higher forms of temporal integration (Freeman 2007), such as the temporally extended narration resulting in our autobiographical self. Both types of temporality are targeted in Beckett's fictional models, and are part of the narrative dynamic core.

The third element I referred to as "agents" is a narratological subcluster—which is, as language and time, a complex one. As Jerome Bruner (2004), among others (Bermúdez 2000), puts it, the narrative of our self "is, of course, a privileged but troubled narrative in the sense that it is reflexive: the narrator and the central figure in the narrative are the same. This reflexivity creates dilemmas" (Bruner 2004, p. 693). In other words, the narratological agency in the structure of the narrative self is at the same time singular and plural. We can also add, as Beckett does, a third agent, who is the author responsible for authenticating (Doležel 1998) the narrator's and the character's existence. In the emergent process resulting in our narrative self, the paradox of a narratological singular plurality usually goes unnoticed. In Beckett's modelling, instead, the unified narration is disintegrated and disassembled, and we can therefore access the role and complexity of this narratologically nested nucleus within the narrative dynamic core.

Moving to the final element, without imagination the very hypothesis of a narrative self would be, pun intended, hard to imagine. The remembered past and the anticipated future, as well as simulations involving counterfactual situations and empathy towards other people (Goldman 2006), require a substantial degree of imagination. In this respect, memories can be considered as a particular kind of imaginative activity, closely interacting with other elements in the narrative dynamic core. For instance, memories clearly support and involve our extended sense of time, and often trigger or are triggered by our inner silent verbalizing.

Language, time, agents and imagination are, I argue, the components that Beckett singled out as the narrative dynamic core whose complex interaction produces the emergent transition leading to our narrative self. These components are either targeted individually by his fictional cognitive models, or modeled altogether in their global interaction. I would therefore class the former kind of texts as *local models*, and the latter as *global models*. I now bring some concrete examples of both types in what remains of the essay. One last important remark, however, is due before proceeding. Once created, models can be manipulated and even damaged to see what happens to the system. As Lewandosky and Farrel note: "[u]nlike people,

models can quite literally be taken apart. For example, we can "lesion" models to observe the outcome on behavior of certain localized dysfunction ... one can do things to models that one cannot do to people, and ... those *lesioning experiments can yield valuable knowledge*" (2011, pp. 27—28; italics mine). This is precisely the kind of use of models we can see operating in Beckett's texts, which can hardly be better described than as lesioning experiments.

Within local models, the first example I would like to present, *Imagination Dead Imagine* (1996), clearly manifests already from the title a lesioning nature towards one of the elements in the narrative dynamic core. The text mainly targets the interaction between two elements in the core—language and imagination—by attempting to manipulate the former to lesion the latter. Here is the beginning of the short prose:

> No trace of life anywhere, you say, pah, no difficulty there, *imagination not dead yet, yes, dead, good, imagination dead imagine.* Islands, waters, azure, verdure, one glimpse and vanished, endlessly, omit. Till all white in the whiteness the rotunda. No way in, go in, measure. Diameter three feet, three feet from ground to summit of the vault. Two diameters at right angles AB CD divide the white ground into two semicircles ACB BDA. Lying on the ground two white bodies, each in its semicircle .... The light that makes all so white no visible source, all shines with the same white shine, ground, wall, vault, bodies, no shadow .... Emptiness, silence, heat, whiteness, wait, the light goes down, all grows dark together, ground, wall, vault, bodies, say twenty seconds, all the greys, the light goes out, all vanishes. At the same time the temperature goes down, to reach its minimum, say *freezing-point*.... (Beckett 1996, p. 182; italics mine)

This narrative beginning is representative of the tension between Beckett's formal modelling strategy (in this text chiefly geometrical) and the chaotic dynamics it aims to disclose. The entire text is an attempt to make the imaginative activity stall. The problem is that lesioning imagination by manipulating language is hard to achieve, since the binding of language and imagination in the narrative dynamic core is tight and constantly activated. Here is where formal modelling can become a necessity, in order to reach a use of language and narrative structures directed at reducing imagination to a bare-bones condition, then hopefully loosening its integration with language and letting both fall apart. If language functionally needs to form a cluster with imagination to generate meanings (and fictional worlds), in this text language is used to restrict the clustering by linguistically articulating the end of imagination. As the first few lines foreground, the unavoidable pitfall is that this uncoupling itself needs to be imagined. A further move is therefore to create a highly formalised narrative situation, in which the other elements in the narrative dynamic core are also reduced to a minimum of activation. The hardly imaginable image of two unnamed *white* bodies lying on a *white* ground and completely still deactivates as much as possible the "agent" element. Also the time dimension, like the temperature, approximates the "freezing point". Yet, "imagination not dead yet", and the "the absence in perfect voids" (p. 184) that later in the text is hoped for is impossible to realise because even the growing dark activates imagination. The positive outcome of this unsuccessful lesioning, however, is to discover, explore and let the

reader experience the indissoluble clustering of two key elements in the narrative dynamic core.

Another case of the local model similarly aiming at lesioning the co-activation of language and imagination is the 1983 short prose *Worstward Ho* (2009a). The analogies with *Imagination Dead Imagine* are evident from the very beginning of this further lesioning experiment:

> On. Say on. Be said on. Somehow on. Till *nohow on*. Said *nohow on*.
> Say for be said. *Missaid*. From now say for be missaid.
> Say a body. Where none. No mind. Where none. That at least. A place. Where none. For the body. To be in. Move in. Out of. Back into. No. No out. No back. Only in. Stay in. On in. Still.
> All of old. Nothing else ever. Ever tried. Ever failed. No matter. Try again. Fail again. *Fail better*. (Beckett 2009a, p. 81; italics mine)

As in the previous modelling example, language is used once again to deflate imagination, this time by means of neologisms, syntactical oppositions and repeated negations of what has just been said. Neologisms and syntactical oppositions (in italics) are of particular interest here in relation to the idea, mentioned earlier in this section, of language as a complex agglomerate of building blocks (phonemes, syllables, morphemes, words, sentences). In order to understand, from a complex system perspective, the use of neologisms and syntactical oppositions in this passage, it might be worth introducing John Holland's description of complex adaptive systems as an interaction of "signals" and "boundaries" (2014).

In a complex system, Holland elucidates, "the network's nodes represent bounded entities (species, neurons, organelles) and the connections between nodes represent the flow of signals between entities" (2014, p. 7). Within what I have defined as the narrative dynamic core, all the four key elements have their own boundaries, from which they can signal each other—as in the constant signaling between language and imagination in the previous text. In complex systems, though, "because there are niches within niches, web-like hierarchies result. In signal/boundary terms, there is a hierarchy of enclosing boundaries, with matching signals at each level" (p. 16). Language, in this view, has its own internal boundaries and internal signaling. In Beckett's local model, neologisms ("missaid") and syntactical oppositions ("nohow on"; "fail better") create a mismatching signaling between words' boundaries. The resulting conflicting signals arising from the juncture of negative ("nohow"; "fail") and positive linguistic particles ("on"; "better") are then undermining the link with, and the activation of, the imagination node. With negations (e.g., "Say a body. Where none") we face a similar conflicting signaling, only at the larger boundary level of sentences. In both cases, the signals reaching the imagination boundary are in this way *almost simultaneously* cuing creative and deactivating stimuli. But once again, the production of a dysfunction in the coordination and interaction of two elements in the narrative dynamic core can disclose some knowledge about the inseparability of this cognitive coupling as well as about the nature, constitution and behaviour of the core itself.

Passing from a local to a global cognitive model in Beckett's work, *Company* (2009a) is a prime example of a text in which at issue is the global activity, the complex signaling and the interacting boundaries of all the elements in the narrative functional cluster. The text is the story of a voice coming to the only amnesic character (but not the only agent) in the dark of an unformed fictional world. The voice retells, in a non-chronological order, fifteen past scenes from the character's life, trying to force him to recognise these memories as his personal story ("To confess, Yes I remember" p. 9). Here it is how the text begins:

> A voice comes to one in the dark. Imagine.
> To one on his back in the dark. This he can tell by the pressure on his hind parts and by how the dark changes when he shuts his eyes and again when he opens them again . . .. To one on his back in the dark a voice tells of a past. With occasional allusion to a present and more rarely to a future as for example, You will end as you now are.
> Use of the second person marks the voice. That of the third the cankerous other. Could he speak to and of whom the voice speaks there would be a first. But he cannot. He shall not. You cannot. You shall not. (Beckett 2009a, p. 3).

To anticipate my interpretation, I want to suggest a reading of the text as a model of the narrative dynamic core whose global activity generates a narrative self. The "one in the dark", amnesic and endowed with just a proprioceptive sense of self ("Your mind never active at any time is now even less than ever so" p. 4) and time-consciousness (he is able to perceive a continuity in the movement of the voice), is a "minimal self" before and beyond the emergent narrative transition that would lead him into a fully fledged identity (Bernini 2014). In order for the transition to occur, all the elements in the dynamic core have to cluster and interact.

Starting from the narratological components, in the quoted passage the narratological agents (character, narrator, author) of the core are already presented through their indexical position. The character, not yet emerged into a linguistic and narrative self, still cannot speak at all, being a pure embodied indexical presence. The narrator speaks in the second person, trying to encode memories into the recalcitrant mind of the character ("To have the hearer to have a past and acknowledge it. You were born on an Easter Friday after long labour. Yes I remember." p. 22). The author ("the cankerous other"), predictably, employs the third person. The three positions, however, are continuously shifted, in order to let the reader perceive the singular plurality of the narratological agents in the creation of a narrative self. The author, we are told at a certain point, is the single yet divided source of the narrative, the "[d]eviser of the voice and of its hearer and of himself" (p. 16). In other words, "[h]e speaks *of* himself as another" (in the third person; italics mine) and, as the deviser of the voice, he speaks *to* himself (in the second person). Recalling the role of inner speech in the constantly ongoing narration in our mind, the memories retold *about* and *to* the author *as* a character can be interpreted as a modelling of inner speech in the narrative dynamic core.

As for the imagination node in the core, the retelling of memories by the voice is constantly presented as a "stretch of imagining" (p. 28) wearing and tiring the hearer, till the moment he will admit to remembering ("[b]loom of adulthood. Imagine a whiff of that. Ah you remember. Cloudless May day." p. 25). As for the time component, the encoding of memories as part of the activity in the core should reach the goal of temporally extending the self beyond his minimal sense of time-consciousness. To sum up, the text can be seen as a modelling of the emergent transition from a minimal self to an autobiographical self (Bernini 2015), operated by the interaction and co-aggregation of all the elements in the narrative dynamic core. There are actually also traces of this modelling procedure *within* the text, when the author evaluates how to ameliorate the modelling, for instance by improving the voice ("Might not the voice be improved?" p. 21) or the hearer ("Would it be reasonable to imagine the hearer quite inert?" p. 33). Like the previous local models, however, also this global model presents moments of lesioning, such as when the voice, after trying to extend the temporal existence of the character, negates to him any kind of future changes in the situation ("You will end as you now are" p. 3). Once again, this lesioning can provide valuable insights about the functioning of the building blocks (here the temporal one) in the narrative dynamic core.

In *Company*, all the nodes are active and interacting from their respective and highly formalised boundaries, casting signals that should in the end generate the flow of a narrative sense of self. As already mentioned, the elements in the narrative dynamic core operating in the mind's complexity are structurally similar to the components of a fictional narrative in general. This is why Beckett, combining introspective insights with narratological expertise, has been able to model, explore and let the reader perceive what lies before and beyond the unified integrating dynamics that gives rise to our rich subjectivity. In a sentence, he has been able to approximate the edge of mind's complexity (that is close to the "edge of sense" Walsh (Chap. 5) auspicates for narratives dealing with complexity), which usually conceals itself.

6 Conclusion

To conclude, in this essay I have tried to show how a specific kind of complex system (the mind) has been the object of exploration of what I have called Beckett's *fictional cognitive models*. Either locally or globally, Beckett's models target the activity of key elements in our mind, whose global interaction is responsible for the emergence of our narrative sense of selfhood. These models clearly do not allow prediction or scientific explanation. Rather, they can be described as what Holland calls "exploratory models", which typically "start with a designated set of

mechanisms, such as the various bonds between amino acids, with the objective of finding out what can happen when these mechanisms interact" (2014, p. 43). In Beckett's case, the designated set of mechanisms he has selected is what I have called the "narrative dynamic core", the functional cluster aggregating language, time, agency and imagination. I argued that he has been able to make this modelling selection within the mind's complexity by means of introspective analysis or, as Beckett calls it in another letter to Duthuit in 1949, a "little session of autology, amid greedy sounds of suction" (2011, p. 139). If I am right, Beckett's work might constitute an exception to the limit of a narrative approach to complexity. As such, it could be regarded in itself as a model of a narrative method to be developed further, in a future where literature can occupy a proper position in the investigation and exploration of complex systems.

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