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Semiotics for the Future. A Semiotic Approach to Prosppection, Memory, and Perception

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Abstract: This paper examines anticipation as a fundamental cognitive and semiotic phenomenon through which humans construct meaning and interpret the world. Drawing on enactive theories of perception, Bayesian inference models, and semiotic frameworks, the study positions anticipation not as mere prediction, but as an active, creative process that generates “significant surfaces” (Paolucci, 2021: 6) mediating our relationship with the environment. The investigation explores the intrinsic connection between memory and prosppection, supported by neuroimaging evidence that shows overlapping neural systems for both processes. Through analyses of Proust’s *madeleine* episode and design practices, the paper discusses how memory functions not as passive storage but as an imaginative reconstruction oriented toward future action, while prosppection operates as a form of abductive reasoning that creates new semiotic universes. The study refers, then, to the distinction between “the clock of narration” and “the clock of interpretation” introduced by Mihai Nadin (2014) to illuminate the temporal gap where human anticipatory capacity emerges. By reconceptualizing anticipation as semiotic action rather than deterministic prediction, this paper offers insights into how humans navigate temporality through creative acts of signification that transcend simple cause-effect relationships, and how the past and the future inhabit the present.

Keywords: Prosppection, Memory, Action, Cognition, Representation.

1. Introduction

It is necessary to clarify from the outset, for the sake of intellectual transparency, that this paper will not offer formulas for predicting the future. Those who expect to find tools here to scrutinize the future would be disappointed: not only is this not the object of our investigation, but there are well-founded reasons to consider such an ambition as inherently illusory.

Though seemingly paradoxical, the semiotic reflection on the concept of anticipation has always been closely linked to the notion of unpredictability. Beginning at least with Lotman’s cultural analyses (2013), the interpretation of the future is connected to concepts of possibility, randomness, and the plurality of cognitive configurations, suggesting that the deterministic approach is not the privileged way to study this phenomenon.

Rather, the first step towards a study of anticipation consists precisely in acknowledging the presumed fallibility of predictive processes. Admitting the inherently flawed nature of predictive systems, however, does not mean surrendering to the idea that we cannot analyze their functioning, nor should it lead us to ignore the pervasive influence they exert on our lives and meaning-making activities. Despite Wittgenstein’s maxim that one should refrain from speaking about what cannot be known, the study of anticipation can—and should—claim its

status as *ignotics*¹, a science of the unknowable, questioning not so much the accuracy of prediction, but the impact it has on the interaction between organism and environment and on the production of meaning that derives from it.

In fact, this investigation examines anticipation as a fundamental cognitive and semiotic phenomenon through which humans construct and interpret the world. The human ability to project consciousness into the future—to simulate, anticipate, and construct potential scenarios—represents one of our most distinctive cognitive capacities. This faculty, termed *prospection*, has played a crucial role in human evolution, conferring significant adaptive advantages by allowing individuals to prepare for future challenges, opportunities, and threats before they materialize.

Although the evolutionary dimension of anticipation is not the central point of this discussion, it is impossible at this juncture to abstain from making a reference—albeit brief—to the concept of *semiotic freedom* with which Hoffmeyer (2007) explains the importance of informational processes for the survival of living beings. According to Hoffmeyer, it is through the capacity to produce inferences and to anticipate possible states that we construct significant surfaces that allow us to relate to the surrounding environment. Even at the most basic level, such as in bacteria, organisms make choices based on their interpretation of chemical signs in their environment. Once established, semiotic freedom tends to increase through evolutionary processes. Communicative patterns that emerge through trial and error, if advantageous, may become reinforced and scaffolded by later mutations. Within this framework, the concept of *semiotic scaffolding* assumes fundamental importance, defined as “the network of semiotic interactions by which individual cells, organisms, populations, or ecological units are controlling their activities”. This network, therefore, “[...] operates [...] through the stabilizing effect of sign action or semiosis that cannot, of course, be described by just enumerating the components of the sign vehicles or referent objects implied” (Hoffmeyer, 2007: 154-156). The definition of semiotic scaffolding resonates with what in Peircean semiotics is called *habit*, the disposition to act formed through repeated experience that determines how we will react in similar future circumstances. We will refer primarily to the latter, but we will discuss how the boundaries between “surface” or “scaffolding” that predisposes action, and actual action, are ultimately not so distinct in this case. We will explore the methodology and orientation chosen for this analysis more thoroughly in the following paragraph.

For the moment, we will start from the (perhaps commonsense) observation that daily existence is thoroughly shaped by our predictive capabilities. Major life decisions—career changes, marriages, home purchases, mortgages, retirement planning—all require intensive engagement with potential futures. Even seemingly ordinary tools demonstrate an orientation toward the future. Consider for example the use of a personal planner: Far from being a mere record-keeping device, it functions as a sophisticated ‘time machine’ that helps us navigate future uncertainties. When we schedule an appointment weeks or months in advance, we are exercising foresight, mapping coordinates in a probable or potential future landscape and committing to specific actions across time.

This is not a random example. The etymology of the personal planner offers deeper insight into this future-oriented activity. In Italian, a planner is called an “*agenda*”, a word derived from the Latin word literally meaning “things to be done”. This terminology, emphasizing action rather than passive recording, highlights how we actively engage with time rather than merely documenting it. This linguistic connection serves as both metaphor and practical example for a central argument of this discussion: recollection, prediction, and perception are fundamentally actions we perform rather than experiences that merely happen to us.

¹ The term *ignotics*, coined by Italian writer Giovanni Papini, refers to the science of everything we do not know (Cf. Carrère, 1986).

2. Methodology

2.1. *The enactive idea of perception*

This active view of cognition aligns with Alva Noë's enactive theory of perception. Noë (2004: 1) argues that "perception is not something that happens to us, or in us. It is something we do". This principle can be illustrated, for example, referring to the way we perceive music². As listeners, we do not passively receive sounds, but actively engage with rhythmic patterns, anticipate melodic progressions, and bodily respond to what we hear. Our perception unfolds through time and requires skilled engagement rather than mere passive reception of auditory input. This portrays perception as active exploration rather than passive reception, a framework we will extend to understanding memory and prediction processes. Just as perception requires engaged interaction with our environment, remembering and anticipating require interpretive action rather than mere information retrieval or projection.

If we apply this framework to memory and prospection, in fact, we apparently find parallels with the enactive idea of action in perception. Perception requires bodily skills and sensorimotor understanding in the same way in which recollection and prospective thinking demand interpretative action. In remembering, we don't simply retrieve information from a stored archive, but we reconstruct experiences and reformulate it through interpretation, informed by the context, our personal culture and the purpose that we may have. In the same way, when we anticipate future events, we engage in creative construction guided by past patterns and present intentions. Therefore, the point is that memory and prospection are activities that we enact rather than information we merely access, but we will develop this point later.

2.2. *The anti-representational nature of Anticipation*

The importance of anticipation processes for living beings has been particularly highlighted by Mihai Nadin, one of the experts on this topic in the semiotic field, who goes so far as to maintain that "a foundation of semiotics that reflects the nature of the living can only be grounded in the anticipatory processes definitory of the living" (Nadin, 2014: 118). While consistent with Nadin's perspective, this paper adopts a definition from Paolucci's (2021) introduction to Cognitive Semiotics, building on Umberto Eco's (2016) famous assertion that everything that can be used to lie can be considered an object of semiotic study. It is widely acknowledged that for Eco:

Semiotics is concerned with anything that can be taken as a sign. Anything that can be taken as a significant substitute for something else is a sign. This 'something else' does not necessarily have to exist, nor must it actually exist at the moment when the sign stands in for it. In this sense, semiotics, in its essence, is the discipline that studies everything that can be used to lie (Eco, 2016: 26).

² Noë originally employed the example of a blind person "tap-tapping his or her way around a cluttered space, perceiving that space by touch, not all at once, but through time, by skillful probing and movement" (2004: 1). However, contemporary research on blindness and perception has evolved since then. Studies by Kupers et al. (2011), for example, demonstrate how visual cortex areas in congenitally blind individuals are functionally recruited for non-visual tasks, suggesting a fundamental neuroplasticity that transcends traditional sensory boundaries. Maidenbaum et al. (2014) documented how sensory substitution devices enable experiences that challenge classical distinctions between visual and tactile perception. Given these advances in our understanding of blindness as involving alternative perceptual modalities rather than mere deficit, Noë's original example risks reinforcing outdated conceptualizations of blindness as primarily characterized by absence rather than by different but equally valid modes of perceptual engagement.

As Paolucci explains, this conception of semiotics does not fully correspond to identifying it with a theory of truth that views language and meaning systems merely as forms of world representation. Rather, it emphasizes the anti-representational nature of semiotics³, wherein semiotic processes (including prediction) do not primarily construct representations of the world or return truthful images of it. Instead, cognition serves to enable effective action in the world by “construct[ing] significant surfaces that are useful within the interaction between an organism and its environment, regardless of their truth bearing content”. The real purpose of cognition is therefore to help us “act in the world in effective ways. And, in order to act in the world in an effective way, it is necessary to build versions of the world that are capable of bringing forth a world, not to represent it” (Paolucci, 2021: 6).

This perspective provides a fruitful framework for understanding prospection as more than mere prediction. By examining prospection through a semiotic lens, we can better understand how humans navigate temporal dimensions and construct meaning across past, present, and future. The present study investigates these connections, focusing particularly on the relationship between prospection and memory, and their roles in perception.

2.3. Empirical evidence of Prospection ability functioning

The medical term “prospection”, derived from the Latin *prospicere* (“to look ahead”), encompasses a composite set of faculties that enable essential cognitive processes such as planning, strategic thinking, and the simulation of future scenarios—whether probable, possible, or merely imaginary (Baumeister et al., 2016; Gilbert & Wilson, 2007; Szpunar, 2010; Szpunar et al., 2014). This capacity has been described using various terminology over the years, including “episodic future thinking” (Atance & O'Neill, 2001), “memory for the future” (Ingvar, 1985), and “mental time travel” (Wheeler et al., 1997). While a comprehensive review of this terminological debate falls outside the scope of this paper⁴, it is significant to note that terms like “memory for the future” and in some ways also “mental time travel” already suggest the fundamental link between prospection and at least two other cognitive mechanisms: memory and spatial orientation. For now, we shall set aside discussion of the latter and focus on the connection between prediction and memory.

Neuroimaging evidence provides empirical support for these connections. Functional magnetic resonance imaging (fMRI) studies reveal that when patients imagine future events, they show activation in neural systems similar to those neural systems involved in the recollection of past events (Schacter & Addis, 2020). This discovery of what might be called an ‘oracle in the brain’—neural circuitry dedicated to both prospective and retrospective mental simulation—underscores the intrinsic connection between prospection and memory, extending these concepts into the realm of perception.

We can also consider how alterations in prospection capacity can be interpreted as problematic relationships with virtuality. Patients with prefrontal lesions often exhibit reduced planning and anticipation abilities, reflecting difficulties in exploring and actualizing virtual fields of future possibilities (Fukui & Murai, 2005). In the same way, if we look at psychiatric conditions such as depression or anxiety, we can see the manifestation of significant alterations

³ In reality, in the original context, the following citations are placed with reference to Cognitive Semiotics. However, it was chosen here to use them as a general definition of Semiotics, as the same author explains how in his vision “[...] cognitive semiotics should not be conceived as a special type of semiotics [...] [It] is not, after all, a kind of semiotics but the vocation of semiotics itself” (Paolucci, 2021: v).

⁴ For an in-depth look at medical terminology, it is suggested to refer to the contribution of Buckner & Carroll (2007).

in prospection ability. In depression, for example, the virtual future appears closed off and devoid of possibilities. This condition can be described as a contraction of the virtual field that drastically reduces actualizable potentials. On the other hand, anxiety disorders present a future saturated with potential threats, and projects a problematic expansion of the virtual field generating anticipation of catastrophic scenarios⁵.

2.4. The Bayesian inference model

Regardless of these examples, the normal functioning of predictive processes can be understood through the Bayesian inference model, that can be described as a statistical approach based on the degrees of confidence in the realization of a possible scenario. This probability, developed *a priori* or/and through data collection, undergoes adjustments based on factual feedback, generating predictive errors that correspond to a negotiation process between inferred possibility and factual reality. This concept forms the cornerstone of Andy Clark's influential work, *Surfing Uncertainty: Prediction, Action, and the Embodied Mind* (2016), which represents one of the most successful applications of the Bayesian model to perception (Paolucci, 2021: 129). According to Clark, the neural processes involved in perception do not passively await stimuli but actively anticipate them, prefiguring and inhabiting them before they arrive.

The 'predictive processing' models [...] implement just such a process of 'rational impact adjustment'. They do so by meeting the incoming sensory signal with a set of top-down probabilistic predictions based on what the systems knows about the world and what it knows about the context-varying reliability of its own sensing and processing. There is a reformulation of Bayes's rule that makes especially clear its relation to such prediction-based models of perception (Clark, 2016: 302).

That means that brain functions as a 'predictive machine' extending continuously toward the horizon of experience. Not just a neutral receptor, but rather a dynamic weaver of probabilities. Predictive flows extend beyond visual feature hypotheses to encompass a rich sensory geography, including motor predictions, affective resonances, and contextual anticipations. When sensory stimuli arrive, they undergo an instantaneous comparison in a multilateral negotiation process: Every discrepancy between prediction and reality generates error signals triggering continuous recalibration of meaning.

In this model, error serves not as an obstacle but as a cognitive medium. Each discrepancy becomes an opportunity for refinement, each surprise an occasion to reconfigure expectations. The neural system incessantly self-modifies, approximating an increasingly accurate representation of reality. Hence Clark's famous characterization of perception as "controlled hallucination" (Koenderink, 2010; Clark, 2016): the mind does not simply record the world but constructs, imagines, and anticipates it. The significance of error proves fundamental to both prediction and mnemonic processes, as will be explored through the analysis of Proust's madeleine episode.

⁵ Hassabis et al. (2007) indicate, for example, that predictive faculties can be compromised in patients with amnesia through experimental tests. For a study on the decline of such faculties in the elderly population, see instead Schacter et al. (2007), or Addis et al. (2008). Recent research by Hallford et al. (2020) demonstrates that individuals with clinical depression exhibit significant impairments in episodic future thinking, characterized by reduced specificity and diminished positive content in prospective simulations. Evidence of this type also derives from studies on autism and from brain imaging, but this is not the place to explore them further.

3. Thought and Action in Memory and Prospection

3.1. Memory as an active inference

Marcel Proust's novel *À la recherche du temps perdu* (1913-1927) offers a paradigmatic example of memory's constructive nature. In the famous *madeleine* episode, the protagonist dips a *madeleine* in hot tea, and the sensory experience triggers a vivid, detailed childhood memory at his aunt's house in Combray. This recollection is not merely a mental association, such as e.g. remembering to respond to a work email, but a deeply subjective, immersive experience in which the character emotionally and sensorially 'relives' the past episode.

I raised to my lips a spoonful of the tea in which I had soaked a morsel of the cake. No sooner had the warm liquid mixed with the crumbs touched my palate than a shiver ran through me and I stopped, intent upon the extraordinary thing that was happening to me. An exquisite pleasure had invaded my senses, something isolated, detached, with no suggestion of its origin. And at once the vicissitudes of life had become indifferent to me, its disasters innocuous, its brevity illusory—this new sensation having had the effect, which love has, of filling me with a precious essence; or rather this essence was not in me, it was me (Proust, 1992: 60-61).

One could say that the *madeleine* scene implies a form of *autonoetic* consciousness, that means a proprioceptive recognition of the self within the memory. This sensory experience distinguishes what neuroscientists call episodic thinking from semantic thinking, a distinction introduced by Endel Tulving (1972) in his studies on mnemonic processes. Tulving distinguished between episodic memory (including autobiographical memory) and semantic memory (involved in reprocessing external elements like language and cultural concepts). The fundamental difference between these mnemonic experiences lies in their "degree of immersion" and spatio-temporal denotation.

When Proust wrote these pages, physiologists were still uncertain about the sensory connections and how they are structured during such processes. His work highlighted memory's deceptive nature during a period when information was thought to be stored in the mind with the fixity of archived files. Modern understanding confirms that memory is not a passive preservation and storage process but an active operation of rewriting, interpretation, and adaptation to personal narrative schemas.

The entire structure of *La Recherche* reflects this insight. As Lehrer (2008: 72) notes, descriptions of remembered characters and objects undergo transformations throughout the novel. An emblematic example is the mole on his lover Albertine's face, which appears variously on her lip, cheekbone, or chin. These are not plot inconsistencies but faithful renderings of memory's extreme fallibility. Proust's work, and in particular this episode, has for these reasons attracted the interest of physiologists, psychologists, and neuroscientists, who have analysed the passage with such rigor as to sometimes embarrass even the literary scholars themselves.

German psychologist Douwe Draaisma (2004), in particular, laments that the overuse of this citation has overshadowed details fundamental to describing the imaginative work and meaning reorganization that Marcel enacts before 'reliving' the childhood episode. According to Draaisma, insufficient attention has been given to the *pleasant bewilderment* phase preceding the specific memory's emergence—a sudden pleasure initially seized 'isolated, detached, with no suggestion of its origin' that Marcel eventually constrains into a conceptual schema, giving form to the memory through an explicit and active interpretation.

Consequently, the phenomenon known as the *Proust Syndrome*⁶ (the existence of which remains unconfirmed) bears little resemblance to Marcel's novelistic experience, which more correctly represents a genuine interpretive act.

The first scholar that revealed how memory functions not as a mental archive but as an active process reorganizing memories in narrative form, was Frederic Charles Bartlett. In his classic *Remembering: A Study in Experimental and Social Psychology* (1932), he demonstrated how our memory narratives emerge from cultural attitudes and mental habits, filling perceptual gaps through inference. For this demonstration, Bartlett employed a relatively simple experiment. He presented participants (predominantly English) with readings of magical folktales from South American folklore, interviewing them after a time interval about their content. Bartlett thus observed that the content of the stories had undergone significant transformations in the participants' memories. The most culturally unfamiliar elements had been forgotten, or modified and readapted to recurring and familiar schemas. The temporality of narrative sequences had also undergone modifications and been reorganized into patterns more consistent with canonical Western narrative structures, altering the very meaning of the narration. To explain this phenomenon, Bartlett developed the concept of Schema, defined as a cognitive structure that automatically adapts information to one's own culture, experience, and prior knowledge. In semiotic terms, regarding what we are accustomed to describing as one's personal encyclopedia. Bartlett concludes that:

Remembering is not the re-excitation of innumerable fixed, lifeless and fragmentary traces. It is an imaginative reconstruction, or construction, built out of the relation of our attitude towards a whole active mass of organized past reactions or experience, and to a little outstanding detail which commonly appears in image or in language form (Bartlett, 1932: 278).

This suggests thinking of memory not so much as a cinematographic eye that reproduces and preserves what it sees, but rather as a process of cognitive storytelling that simultaneously fills gaps in perception and interprets and reorganizes it into narrative schemas influenced by the perceiver's culture and structured according to a logic consistent with their global autobiography.

3.2. Design in Prospection

The inherently creative and constructive nature of memory allows us to introduce abduction reasoning as a further manifestation of the human prospective faculty, shifting the focus from the reconstruction of the past to the active prefiguration of the future. A particularly interesting perspective in this regard is that developed throughout various studies on Design and Project by Salvatore Zingale (2012, 2022a, 2022b). Zingale describes how the creative process of design is comparable in certain respects to a sort of ontogenesis of possible worlds, a creation of semiotic universes and possibilities that would otherwise not exist. The projectual dimension, therefore, the creative response to the existence of a problem, becomes an epistemological instrument that aims at the production of knowledge through projection toward future configurations.

It is the performative dimension of the creative design that highlights the peculiar nature of this activity and that relate it with the abductive reasoning. Design does not limit itself to describing or interpreting reality, but actively transforms it through the introduction of new signification systems. That's why the abduction, characteristic of the design process, operates

⁶ [...] In the psychology of memory, the 'Proust phenomenon' has come to stand for the ability of smells to call forth early memories. It is often presented as a quick, almost instantaneous process. In that sense, the scene with the madeleine is anything but a Proust phenomenon (Draaisma, 2004: 33).

as a form of retrospective reasoning from the future, where the hypothesis emerges as a prefiguration of entities not (yet) existing:

Abduction is indeed an oscillating movement of the mind, which shifts its vision between past, present and future, between what is and what could be. When looking towards the past, the mind seeks the causes or origins (the antecedents) that led to a certain state of affairs, which presents itself as a singular and surprising fact (the consequent). When looking towards the future, however, the mind seeks to overcome a problematic state. It is not properly in search of a necessary or historical antecedent (that which cannot not have been), but of a possible antecedent (that which can be). The gaze towards the past makes abduction a retroduction; that towards the future makes abduction projective. In the first case, abductive reasoning presumes in hypothesis the possible antecedent: it is an act of effective “presumption”, not only in the sense of conjecture, but also in that of self-confidence and the ability to see correctly. In the second case, abduction is instead an “assumption” of responsibility: because it accepts the burden of the challenge and because on what it assumes in hypothesis it projects its future action (Zingale, 2012: 125, mine trans.).

This inferential leap constitutes a process that we might define as retro-projective abduction, where the designer actualizes in the present the consequences of future possibilities still virtual. Such a cognitive mechanism reveals the deeply temporal dimension of semiosis: the abductive sign exists in a stratified temporality, simultaneously anchored to the present of its creation and projected into the future of its realization. Design thus becomes a form of *archaeology* of the future, an exploration of artifacts that do not yet exist but which, through the creative act, acquire a form of virtual existence capable of influencing the present.

This conception is helpful for our understanding of the functioning of prospection, because it suggests that the human anticipatory faculty is not just aimed to simulating future scenarios based on past experiences or memories but rather possesses the generative capacity to build completely new semiotic universes. The main distinction between prediction and design resides precisely in this capacity. If prediction attempts to anticipate what might happen based on existing trends, design actively constructs what would not exist without human intervention. It means thinking of design not only as an expression of prospection, but rather as its enhanced extension, a second-order prospection that transcends simulation to become something new.

As Zingale also notes, “the logic of abduction, or abductive behaviour, has to do with the very purpose of pragmatism” (Zingale, 2012: 45, mine trans.) precisely because it is in action, or in stimulating action, that it finds its profound reason. The truth conditions, the actual factual verification, thus assumes a circumscribed importance, playing a secondary yet not entirely negligible role in the overall interpretative framework. It is Peirce himself who describes how:

[...] if pragmatism is the doctrine that every conception is a conception of conceivable practical effects, it makes conception reach far beyond the practical. It allows any flight of imagination, provided this imagination ultimately alights upon a possible practical effect (CP 5.196 in Zingale, 2012: 147).

The idea that every creative act constitutes an expression of anticipation is extensively supported by Nadin (2015), who distinguishes between physical systems and living systems. For Nadin, physical systems are characterized by a decidable, deterministic framework where identical causes invariably produce identical effects, and they operate according to reactive causality (the past affecting the present). This conceptualization follows the tradition of Cartesian reductionism and Newtonian mechanics, which Nadin contrasts with the anticipatory nature of living systems that can produce different and often multiple outcomes from identical initial conditions. This capacity to generate original results forms the foundation of biological creativity. From a deterministic perspective, it is in the past that we can identify the causality

triggering the effect (the future realization or projection). However, as argued in the previous section, prospection is better conceived as an original creative act rather than a recollection of memory, and memory itself, in turn, is a creative act oriented more toward the future than toward the recollection of the past. How, then, can we explain the relationship between memory and anticipation without falling into the trap of determinism and the cause-effect relationship?

4. The Clock of Narration and The Clock of interpretation

The concept of narrativity appears particularly useful, both for explaining the different levels of meaning (the “significant surfaces” we mentioned) generated in prospective thinking (past or future directed), and for theorizing an analytical model for observing these phenomena. Narrativity, however, can be understood in different ways:

- As a tendency to interpret intentional actions through the motivations that precede them (beliefs, desires, and other mental states).
- As a sequence of events arranged on a timeline.
- As an act of interpretation of such events.

The fundamental distinction between *narration* and *interpretation* has been discussed by Nadin, who describes narration as a “record of change”, distinguishing it from the “story”, which represents the “open-ended process of interpreting narration” (Nadin, 2014: 115). Narration as a temporal sequence of events can thus be understood as raw data, the natural succession of causes and effects, while story constitutes the interpretive process through which these events are endowed with meaning, contextualized, and inserted into a network of causal and symbolic relationships.

On one hand, narrations are representations of the change – sequential recordings of events that constitute the raw material of our temporal experience; on the other hand, stories involve interpretative action – active processes of signification that transform mere succession into a construction of meaning:

As interpretations, stories are contextual. In storytelling (memories, memoirs, fictional works, among many kinds of interpretations), data is associated with meaning. Quite often, intentionality takes over: moralizing, alerting to danger, making false statements, debunking false statements, etc. Narrations are intention-free. Stories are driven by goals, that is, by intentions (Nadin, 2014: 116).

Thus, if memory – as discussed – is an active and creative process of interpretation that continuously reorganizes memories in narrative form, selecting, emphasizing, and reconfiguring elements based on the cognitive and cultural schemas of the present, prospection reveals itself not as mere mechanical prediction based on the extrapolation of observed trends, but as a creative interpretation of future possibilities emerging from the interaction between past experiences, present context, and imaginative capacity.

Indeed, it is precisely through stories (interpretative acts) that information is associated with meaning, an observation that illuminates both the retrospective process of memory and the prospective process of anticipation, both guided by specific intentionality and purposes.

A particularly relevant aspect of this relationship lies in the temporal difference between what Nadin defines as “the clock of narration”, which “corresponds to the rhythm of events in the physical world”, and “the clock of interpretation”, which “projects into the physical world rhythms characteristic of change in the living” (Nadin, 2014: 117).

This temporal gap is not merely quantitative but qualitatively significant: it represents the semiotic space in which human anticipatory capacity is located. As Nadin states, “the future

itself is nothing but the outcome of a faster clock. As a virtual reality, this future depends on the rate of change expressed by the clock” (Nadin, 2014: 118).

Memory thus always involves an element of anticipation insofar as it reorganizes mnemonic material according to future expectations; likewise, prospection cannot disregard memory, as it draws from the repertoire of past experiences the models and schemas through which to prefigure future scenarios.

This continuous dialogue between narration and interpretation, between recording and signification, is particularly evident in pathological cases where the prospective faculty undergoes alterations as previously mentioned (*Infra* Par. 2).

In light of these considerations, we can agree with Nadin when he maintains – as we mentioned – that “a foundation of semiotics that reflects the nature of the living can only be grounded in the anticipatory processes definitory of the living” (*Ibid*). Memory and prospection are configured as complementary interpretive processes that construct meaning through temporal narrations, allowing us to simultaneously inhabit past and future, in a continuous dialogue between what has been recorded and what is interpreted as possible.

5. Conclusions

Repositioning memory and prospection at the center of perceptual activity means acknowledging that both past and future inhabit the present moment and confer upon it form and meaning. The consequence is a questioning of the delicate equilibrium between what we consider real and what is imaginary, and particularly of a representation—perhaps falsifying—of memory as a repository of immutable narratives and of the future as mere reverie or statistical accumulation. In contrast to this view, it is preferable to describe memory as a dynamic, interested, and future-oriented activity, and prospection as a creative mechanism intrinsically linked to it.

The forecasting of the future proves to be an essential tool in our relationship with reality, an innate faculty in our existence as *semiotic animals* that guides us in interpreting both signs and surrounding reality, as well as ourselves, our past, and our inner world. This is perhaps one of the principal reasons for our interest in a systematic study of its functioning, which seems to implicate the semiotic disciplines while simultaneously involving various disciplines, from neuroscience to biology, from phenomenology to psychology, and so forth. But beyond the potential and reciprocal influences from other spheres of knowledge, it is interesting to note how an implicit interest in analogous phenomena can be discerned in different approaches within the same discipline.

We have already mentioned Lotman’s cultural analyses and his engagement with the unpredictability of semiotic systems. Reference has been made to Hoffmeyer’s studies and the concept of semiotic scaffolding, fundamental to biosemiotics and the interest in an evolutionary trajectory connected to anticipatory capacity. We have not mentioned (for the sake of brevity) Umberto Eco’s works on the role of inferential processes during the decoding of a narrative text, on cooperation and triangular interaction among reader, text, and author (or authors, in the plural), as well as inferential walks and the concept of the encyclopedia, that fundamental in understanding predictive processes. The list could continue, and the reader is certainly thinking of how many eminent absences there are in this rapid review.

The point is that the pervasive presence of future projection in the interests of Semiotics as well as the variety of possible approaches and applications, both within and beyond textuality, on the individual as well as the collective and cultural plane, perhaps suggest the necessity of a semiotics for the future. A study of the modalities through which we render the possible present, and of how the future, sometimes as threat, sometimes as hope, already inhabits our daily lives. And this seems sufficient reason for it to be discussed.

References

- Addis, D. R., Wong, A. T., & Schacter, D. L. (2008). Age-related changes in the episodic simulation of future events. *Psychological Science*, 19(1), 33–41. <https://doi.org/10.1111/j.1467-9280.2008.02043.x>.
- Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. *Trends in Cognitive Sciences*, 5(12), 533–539. [https://doi.org/10.1016/S1364-6613\(00\)01804-0](https://doi.org/10.1016/S1364-6613(00)01804-0).
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge University Press.
- Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, 20(1), 3–16. <https://doi.org/10.1037/gpr0000060>.
- Buckner, R. L., & Carroll, D. C. (2007). Self-projection and the brain. *Trends in Cognitive Sciences*, 11(2), 49–57. <https://doi.org/10.1016/j.tics.2006.11.004>.
- Carrère, E. (1986). *Ucronie*. POL. Editeur.
- Clark, A. (2016). *Surfing uncertainty: Prediction, action, and the embodied mind*. Oxford University Press.
- Damasio, H., Grabowski, T., Frank, R., Galaburda, A. M., & Damasio, A. R. (1994). The return of Phineas Gage: Clues about the brain from the skull of a famous patient. *Science*, 264(5162), 1102–1105. <https://doi.org/10.1126/science.8178168>.
- Draaisma, D. (2004). Smell and memory. In A. Pomerans & E. Pomerans (Trans.), *Why life speeds up as you get older: How memory shapes our past* (pp. 31–44). Cambridge University Press.
- Eco, U. (2016 [1975]). *Trattato di semiotica generale*. La nave di Teseo.
- Fukui, H., & Murai, T. (2005). Functional activity related to risk anticipation during performance of the Iowa Gambling Task. *NeuroImage*, 24(1), 253–259. <https://doi.org/10.1016/j.neuroimage.2004.08.028>.
- Gilbert, D. T., & Wilson, T. D. (2007). Prospection: Experiencing the future. *Science*, 317(5843), 1351–1354. <https://doi.org/10.1126/science.1144161>.
- Hallford, D. J., Barry, T. J., Austin, D. W., Raes, F., Takano, K., & Klein, B. (2020). Impairments in episodic future thinking for positive events and anticipatory pleasure in major depression. *Journal of Affective Disorders*, 260, 536–543. <https://doi.org/10.1016/j.jad.2019.09.039>.
- Hassabis, D., Kumaran, D., Vann, S. D., & Maguire, E. A. (2007). Patients with hippocampal amnesia cannot imagine new experiences. *Proceedings of the National Academy of Sciences*, 104(5), 1726–1731. <https://doi.org/10.1073/pnas.0610561104>.
- Herz, R. S., & Schooler, J. W. (2002). A naturalistic study of autobiographical memories evoked by olfactory and visual cues: Testing the Proustian hypothesis. *The American Journal of Psychology*, 115(1), 21–32. <https://doi.org/10.2307/1423672>.
- Hoffmeyer, J. (2007). Semiotic scaffolding of living systems. In M. Barbieri (Ed.), *Introduction to biosemiotics: The new biological synthesis*. Springer.
- Ingvar, D. H. (1985). 'Memory of the future': An essay on the temporal organization of conscious awareness. *Human Neurobiology*, 4(3), 127–136.
- Koenderink, J. J. (2010). Vision and information. In L. Albertazzi, G. J. van Tonder, & D. Vishwanath (Eds.), *Perception beyond inference: The information content of visual processes* (pp. 27–57). MIT Press.

- Kupers, R., Pietrini, P., Ricciardi, E., & Ptito, M. (2011). The nature of consciousness in the visually deprived brain. *Frontiers in Psychology*, 2(19), 1–14. <https://doi.org/10.3389/fpsyg.2011.00019>.
- Lehrer, J. (2008). *Proust era un neuroscienziato*. Codice Edizioni.
- Lotman, J. M. (2013). *The unpredictable workings of culture* (B. J. Baer, Trans.; I. Pilshchikov & S. Salupere, Eds.). TLU Press.
- Maidenbaum, S., Abboud, S., & Amedi, A. (2014). Sensory substitution: Closing the gap between basic research and widespread practical visual rehabilitation. *Neuroscience & Biobehavioral Reviews*, 41, 3–15. <https://doi.org/10.1016/j.neubiorev.2013.11.007>.
- Nadin, M. (2014). Semiotics is fundamental science. In M. E. Jennex (Ed.), *Knowledge discovery, transfer, and management in the information age* (pp. 76–125). IGI Global. <https://doi.org/10.4018/978-1-4666-4711-4.ch005>.
- Nadin, M. (2015). Anticipation and creation. *Libertas Mathematica (New Series)*, 35(2), 1–16.
- Noë, A. (2014). *Action in perception*. MIT Press.
- Paolucci, C. (2021). *Cognitive semiotics: Integrating signs, minds, meaning and cognition* (Vol. 24). Springer International Publishing. <https://doi.org/10.1007/978-3-030-42986-7>.
- Peirce, C. S. (1931–1958). *Collected papers of Charles Sanders Peirce* (Vols. 1–8). C. Hartshorne, P. Weiss, & A. W. Burks (Eds.). Harvard University Press.
- Proust, M. (1992 [1913–1927]). *In search of lost time* (C. K. Scott-Moncrieff, T. Kilmartin, & D. J. Enright, Trans.). Modern Library.
- Schacter, D. L., & Addis, D. R. (2020). Memory and imagination: Perspectives on constructive episodic simulation. In A. Abraham (Ed.), *The Cambridge handbook of the imagination* (pp. 111–131). Cambridge University Press. <https://doi.org/10.1017/9781108580298.008>.
- Schacter, D. L., Addis, D. R., & Buckner, R. L. (2007). Remembering the past to imagine the future: The prospective brain. *Nature Reviews Neuroscience*, 8(9), 657–661. <https://doi.org/10.1038/nrn2213>.
- Suddendorf, T., & Corballis, M. C. (2008). Episodic memory and mental time travel. In E. Dere, A. Easton, L. Nadel, & J. P. Huston (Eds.), *Handbook of episodic memory* (pp. 31–42). Elsevier. [https://doi.org/10.1016/S1569-7339\(08\)00203-8](https://doi.org/10.1016/S1569-7339(08)00203-8).
- Szpunar, K. K. (2010). Evidence for an implicit influence of memory on future thinking. *Memory & Cognition*, 38(5), 531–540. <https://doi.org/10.3758/MC.38.5.531>.
- Szpunar, K. K., Spreng, R. N., & Schacter, D. L. (2016). Toward a taxonomy of future thinking. In K. Michaelian, S. B. Klein, & K. K. Szpunar (Eds.), *Seeing the future: Theoretical perspectives on future-oriented mental time travel* (pp. 21–35). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780190241537.003.0002>.
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), *Organization of memory* (pp. 381–403). Academic Press.
- Wheeler, M. A., Stuss, D. T., & Tulving, E. (1997). Toward a theory of episodic memory: The frontal lobes and autonoetic consciousness. *Psychological Bulletin*, 121(3), 331–354. <https://doi.org/10.1037/0033-2909.121.3.331>.
- Zingale, S. (2012). *Interpretazione e progetto*. Franco Angeli.
- Zingale, S. (Ed.). (2022a). *Design e alterità: Comprendere l'altro, pensare il possibile*. Franco Angeli.
- Zingale, S. (2022b). The abduction of the future between inventive thinking and speculative design. *Linguistic Frontiers*, 5(3), 14–21. <https://doi.org/10.2478/lf-2022-0020>.