A Difference That Makes No Difference: Uncertainty in and of the Observer

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> Context • The problem of uncertainty (the unknown, uncontrolled, unpredictable and other risk factors) that our life is fraught with is a topic of major concern across multiple scientific disciplines, from mathematics to social studies. **> Problem** • Humberto Maturana's rich philosophical legacy offers biological insights into the construction of knowledge in the living system. While he focused on the systems approach to cognition as a recursive biological process that needs a difference to make a difference, Maturana also made a number of relevant and valuable claims about experiential situations when a difference makes no difference at all. **> Method** • We overview agnostic principles that were formulated in, or can be inferred from, Maturana's philosophy. We apply these principles to a systems analysis of uncertainty across different dimensions of human experience – cultural, situational, perceptual, biological and epistemological. Along these lines, we distinguish between the biocognitive, or biological-cultural, aspects of uncertainty: the known, unknown, indistinguishable, inoperable and unknowable. **> Results** • We have established that the observer finds herself in what she describes as uncertainty because (a) reflection allows for the ability to distinguish the inability to distinguish, the ability to know that there is something unknown. Yet, prioritized in the rationalist tradition of educational practices, the logic of reflective thought has rendered uncertainty a negative derivative of reason that should be dismissed as irrelevant to the search for "true" meaning; (b) as a primary source of what happens in and to it, the living system, that every observer is, cannot (be observed to) know or control any other sources of what happens; (c) what biologically happens in the system cannot be predicted by or deduced from what happens to the system behaviorally, and vice versa; (d) when the observer interacts with another organism, the appearance of the distinguished entity happens in accordance with the coherences of the distinguisher, not the distinguished; (e) the observer has an epistemological need for the imaginary and unknowable substratum of existence to account for the emergence of a distinguished item. **> Implications** • Our research links uncertainty to a function of the brain-body-environment system, which opens an ecological perspective on risk. **> Constructivist content** • We build on the constructivist concept of the biology of cognition and cultural-biology as well as developing cybernetic and systemic approaches to agnosticism. **> Key words** • **Agnosticism, cognitive ecology, cybernetics, recursion, risk, naturalism, systemic approach.**

Introduction

« 1 » What if right now something is happening in our bodies that will soon lead to the emergence of cancer cells in our brain? Perhaps, today, the leader of a neighboring country is finalizing their decision to invade our land, and tomorrow a war will break out, changing our lives forever. Or maybe our former classmate and good friend, who has risen to the top, will offer us the job we have been dreaming of. The thought of all these possibilities can make us feel uncertain about how and where we live, presenting itself as an unsettled intellectual problem that needs more inquiry. What will make us feel even more uncertain is another thought: that we cannot change the processes already occurring in our neural, social and political networks, no matter how healthy or wealthy we are.

« 2 » How natural is it to have such thoughts cross our mind from time to time? Is uncertainty a side effect of our cognition? According to the dominant approach in science, it is indeed so. Uncertainty is primarily understood in terms of inclusion and exclusion to categorize a wide range of situations involving partially or entirely unknown and unobservable environments, uninformed decision making and choices that lead to outcomes that are impossible to fully predict and calculate (Tversky & Kahneman 1974). This seems to be one of the most interesting and challenging scientific topics; even the most exact of sciences, mathematics – with its strictly formalized language of axiomatization – still struggles to come to terms with the unsolved problems that this language poses (Kauffman 2025). As more and more cognitive biases and heuristics are added to the already existing list, human sciences, too, acknowledge bounded rationality and the inability of humans to know "reality" as it "is" (Gash 2020: §9).

« 3 » A radically different and even surprising perspective on uncertainty would be to argue that it is both known and unknown, natural and unnatural at the same time. What we might not know is not excluded from the known, but rather enables and constrains it (and vice versa). This argument from mutual causality characterizes the biocognitive, and more broadly, the cultural-biological philosophy of Humberto Maturana that, as we will argue further, harmoniously aligns with John Dewey's naturalist theory of multidimensional human experience.

« 4 » In his insightful investigations of the organization of living (Capra 2022; Mpodozis 2022), Maturana seemed to ar-

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gue that uncertainty is a paradoxical notion. On the one hand, "living systems mostly do not live in what we could call uncertainty" (Maturana 1998: 240) – it is humans as observers who make this epistemological attribution by believing in planning and at the same time believing that planning does not always work. Living can neither be certain nor uncertain because "there are no anticipatory processes in the cosmos" (Maturana 2008a: 18). Lack of knowledge is a distinction made from within our culture, not nature: when we say that an organism does "not know" something, we (metaphorically) describe the organism's doings in our own terms external to the organism and its doings. In other words, "not knowing" is in our language and behavior rather than part of our or someone else's biology. Along these lines, the term "uncertainty" is a language-based abstraction from the inability to predict the occurrence of processes. On the other hand, this inability is as biological as any other cognitive capacity: prediction itself is an abstraction from cause-effect (temporal) relationships that do not exist in nature – only in our explanations of it. Predictable, i.e., repeatable, doings and happenings are artificially designed to be so in our language, culture and technology by virtue of "digital intelligence" (Dávila & Maturana 2023), while we humans in our coexistence generate an analogical cosmos where living beings exist as non-repeatable historical individuals (ibid: 525). Our praxis of living as observers puts "a question mark on any perceptual certainty" (Maturana 1988: 10). In Dewey's words, we are born to live in an uncertain environment by the very nature of our mind and body: "Since we are creatures with lives to live, and find ourselves within an uncertain environment, we are constructed to note and judge in terms of bearing upon weal and woe – upon value" (Dewey 1929: 28).

« 5 » Such an approach to uncertainty needs more certainty, especially given that Maturana's works on what it is to know, see and do both within human culture (e.g., Maturana 1983; Méndez, Coddou & Maturana 1988) offer extensive material that allows us to interpret what it is *not* to know, *not* to see and to do neither in the domain of human culture. In this article, we set ourselves the goal of piecing together agnostic principles that were formulated in or can be deduced from the biocognitive philosophy and systems biology of Maturana and his colleagues (Maturana, Dávila & Ramírez 2016; Dávila & Maturana 2023). To this end, we will discuss the cultural meaning of uncertainty, or the way uncertainty arises as an explanation and experiential coherence of our living as observers, then we will trace uncertainty back to our internal constraints and conditions (or better, *enabling constraints*), from which it arises. Thus, we will analyze uncertainty across several dimensions of human experience and will distinguish between such aspects as:

a the known (cultural);
b the unknown (situational);
c the indistinguishable (perceptual);
d the unknowable (epistemological); and
e the inoperable (biological).

The known

« 6 » Culture is a remarkable achievement of human evolution. It equips us with a rich array of tools – both practical and conceptual – to navigate our life-world. Often, we glean insights about nature not through direct experience, but through the shared wisdom of others. As Dewey (1929: 14) notes,

> "…the ways in which we believe and expect have a tremendous effect upon what we believe and expect. We have discovered at last that these ways are set, almost abjectly so, by social factors, by tradition and the influence of education. Thus we discover that we believe many things not because the things are so, but because we have become habituated through the weight of authority, by imitation, prestige, instruction, the unconscious effect of language, etc."

« 7 » This applies to the phenomenon of uncertainty, emergent within the cultural cradle of our existence as a linguistic distinction between what is and what merely appears, between knowledge and ignorance. The meaning of uncertainty is constructed through the lens of social evaluation: we learn from others what it feels like to be uncertain. Our attitude to uncertainty is informed by how others perceive, articulate, and respond to our behaviors. It seems that in our cultural narrative uncertainty is an evil. As noted by one of our anonymous reviewers, contemporary culture tends to privilege certainty, truth and control while framing the experience of not knowing as a deficiency, threat, or even failure. We find ourselves culturally predisposed to view uncertainty with suspicion and disdain. The loss of control and assurance is devalued in a society centered on relations of power and competition (Maturana 1999; Krippendorff 2023; Dávila & Maturana 2023). Consciously or unconsciously living this undeserved devaluation as legitimate, we are trapped into experiencing uncertainty as a source of suffering and pain.

« 8 » Why do we, in our culture, believe and know that uncertainty is not good? According to Dewey, this bias comes from the philosophical tradition of intellectualism perpetuated in educational practices. Because etymologically philosophy is the love of wisdom, it tends to prize knowledge and reason as ways of finding good and avoiding evils. Knowledge becomes synonymous with Being:

> "Things that change are too unstable to be subjects of knowledge in its exact and complete sense. Knowledge as distinct from sense and opinion is fixed; truth does not alter. Hence its subjects ('objects' in our sense) must also be invariable. Seen from this point of view, Nature presented the scientific mind with an ordered grade or hierarchy of qualitative things from emptiness up to Being in its full sense" (Dewey 1938: 84).

« 9 » In pursuit of better Being, one should rely on reflective inquiry and "pure" reason. Yet, Dewey pointed out that reflection itself can be a source of fallacies. In particular, when we think out the solution to some cognitive problem, our view of the problem can be distorted. We will summarize Dewey's critique of rationalist methodology.

« 10 » By its very nature, reflection is a purposeful act of intellectual inquiry unfolding through a series of steps. Initially, our situation feels problematic due to perturbations that create a need for certainty. This need, then, propels reflective thought to select a specific aspect of the lived experience, isolating it from the continuous flow of affect-rich interactions. In this process, the

chosen experience is turned upon itself in the way that leads to the emergence of a new abstraction. Finally, this abstraction offers not only a sense of satisfaction but also re-contextualizes the situation, imbuing it with fresh meaning. The value of the analytic outcome is elevated compared to the original subject matter from which it was derived. The primary cognitive problem is remembered now in terms of its solution that transforms the previously unknown into and through the new knowledge. This knowledge feels authentic and allows for greater control and stability. It evolves into a virtue – a guiding principle that shows the way "out of the dark." In contrast, the original uncertainty, which sparked this reflective journey to the light, is now viewed as a deficiency or irregularity, something to be set aside as we pursue further inquiries. Thus,

> "…certainty, assurance, is immensely valuable in a world as full of uncertainty and peril as that in which we live. As a result whatever is capable of certainty is assumed to constitute ultimate Being, and everything else is said to be merely phenomenal, or, in extreme cases, illusory." (Dewey 1929: 26).

« 11 » Thus, the observer finds herself in what she distinguishes as uncertainty because of reflection enabled by language in the domain of culture. An uncertain person is aware that she does not know something; more than that – she feels that it is wrong not to know something. She is *uncertain about uncertainty*. Is this feeling adaptive or adequate to her situation?

The unknown

« 12 » A brief linguistic analysis shows that uncertainty is a derivative term with a negative meaning. It is implicit in words with the prefix "un" that *what is not* is secondary to *what is*. By the same token, uncertainty and the unknown are viewed as secondary phenomena because they semantically originate from certainty and the known. Along these lines, we tend to believe that we can predict, control and simply grasp what presents itself in our experience but fail to do so because of too many details around us and too little time for "getting hold of" them. In other words, when we do not know something, it is because we believe we cannot act in a proper way, taking all the opportunities our life offers.

« 13 » From a naturalist and systemic perspective, this is a reversed understanding of our situated experience. We always act in a proper way, at least, in accordance with our situation – the totality of what is present here and now as where and how we find ourselves *before* we even know it. Knowledge comes second and transforms the unstable and ambiguous aspects of our situation. What comes first is an unanalyzed whole, our primary experience of things had "prior to and independent of any reflective analysis" (Dewey 1987: 259). From this, proponents of embodied cognition, Mark Johnson and Jay Shulkin, infer that "we begin, experientially, not with particular objects, but rather with a whole situation unified by a pervasive quality" (Johnson & Shulkin 2023: 55). So, the unknown is a *natural occurrence* in our primary experience but it does not qualify as such until it is analytically singled out in a secondary act of reflection on our situation: "Illusions are illusions, but the occurrence of illusions is not an illusion, but a genuine reality" (Dewey 1929: 20).

« 14 » Such a spatio-temporal (situational) constraint put on our living by the flow of our living implies that the whole is always primary to its parts, and our primary experience of (or better, *as*) an undivided whole makes our living orientable and all meaning-making possible. Maturana referred to such a primary totality of everything that we distinguish as happening with the term *observer*, and the experience of this totality – with the term *observing*:

> "[T]he observer and observing, as biological phenomena, are ontologically primary with respect to the object and the physical domain of existence. […] [E]verything that takes place is brought forth by the observer in his or her praxis of living as a primary experiential condition, and any explanation is secondary. […] The observer is primary, not the object. Better, observing is given in the praxis of living in language, and we are already in it when we begin to reflect upon it." (Maturana 1988: 4, 11, 50).

« 15 » Let us illustrate the significance of this systemic claim. In our culture and language where, for the reasons we have discussed above, finalistic and causal terms prevail, we tend to describe primary and secondary relations as reducible. For example:

- Our thought derives from our brain activity. That is why brain is primary, thought is secondary.
- Our surroundings derive from objects that compose them. That is why objects are primary, surroundings are secondary.

« 16 » Maturana's systemic logic (the logic of systemic wholeness, Bunnell 2020) reverses this order: The whole is always primary and cannot be reduced (back) to its parts because they appear in, and therefore derive from, the wholeness of the unity they compose:

- Our brain activity is secondary to our thought as our thought of brain activity makes brain activity possible as an object of thought. Our brain cannot subsist independently of our behavior; the remainder of our organism and ourselves as observers cannot vanish when we are thinking of our brain (Gomez-Marin 2020; Druzhinin & Fomina 2023). That is why brain is secondary to thought.
- Objects in our surroundings result from our attending to these objects from within the surroundings where we reveal them. Objects are secondary if there is a larger whole from which they can (should) be distinguished (Gahrn-Andersen 2024). That is why objects are secondary to the surroundings they compose.

« 17 » Contrary to what our language suggests, the whole is experientially primary to what can be distinguished as its parts and our perception is evidence of it. Even though we know that the film we are watching on the screen is a fiction composed of numerous artistic and technical elements (the work of actors, a director, sound editor, etc., the projection of light, the reproduction of sound, etc.), this knowledge does not prevent us from taking the film to be something perceptually "real," the moment we are watching it (Druzhinin 2020). As viewers, we are not perceiving all these components – we are perceiving their composition, which is a totality for us, at least, the moment we are interacting with it for the first

time. Yet, this totality may stop being a totality and be decomposed into parts when we watch the film again, beginning to note details we have not observed and act as *re*viewers rather than viewers. One way or another, all such distinctions come second and owe their appearance to the primary wholesome experience of viewing.

« 18 » What exactly is unknown? When Maturana claims that a composite unity as a totality interacts with the medium, he also says it *encounters* its medium, which implies that the interaction is based on the principle of locality. What is local to us? Whatever enters into "neighborhood relations" with us (Maturana 1979: 22). Can our nervous system be considered a neighbor? Definitely not; only one cell can maintain a local relationship to another. Can our society or country function as a local entity? Not quite, as these are already global in relation to us. We can only engage directly with particular components of the social or political system that fall within our experiential reach. In other words, we "live and act in connection with the existing environment, not with isolated objects" (Dewey 1938: 68); everything we do and know is localized within our situation of existence, or, in Maturana's terms, is observer-dependent. In this sense, the unknown resides outside of the observer's neighborhood relations. We can locally observe what is around us, but we cannot locally observe what is in or beyond us. For this reason, *the unknown is what happens to a part and is part of what happens to the whole*.

« 19 » Firstly, we can never fully know what happens to a part because everything that is, happens to the whole, not its parts, with them only making this happening possible. If something (i.e., our brain) or somebody (i.e., our loved one) is part of who we are, our understanding of them begins with, and is determined by, our understanding of who we are here and now, i.e., our situation. Therefore, we have to concede that we do not know what happens to or in these parts of us, but we do know what happens to us as whole of these parts.

« 20 » Secondly, by saying that the unknown is part of what happens to the whole, we mean that the qualitative whole of our primary experience is naturally lived as unfalsifiable. We usually do not and even cannot know what will come second, the moment something comes first. Our primary experience guides us towards secondary knowledge but cannot be influenced or changed by it, otherwise it becomes secondary in relation to this knowledge. The neighborhood relations of locality through which we encounter the medium narrow the scope of operability with what we encounter, the moment we encounter it. It leads to our failure to fully understand in our "here and now" the "not here" and the "not now."

« 21 » For example, through our actions here and now we may know that we are participating in a larger system, but how and what this system is, where it begins and where it ends, what is happening in or to it, is not fully known to us. Often, such a kind of uncertainty arises in people who may assume that they (must) identify with the state they officially belong to and "embody" it in everything they do, say and think. It is biocognitively impossible because, as components of the composite unity (a political totality), people do not have the composition of this totality as part of their own composition, therefore they cannot operate as their country, nor can they fully understand all the complexity of its political operation (decision making and its motivation). What people can do is to act as citizens on local encounters with what they name as their country – fulfil orders and abide by laws. Thus, citizens cannot predict how the political system they compose may behave. Even those "in power" do not have this kind of certainty, as the same applies to their manner of operation, with only a slight difference. Politicians find themselves in neighborhood relations with the resources that the system produces when operating as a political totality but (unfortunately) they, in turn, cannot encounter all other operational consequences of this system.

The indistinguishable

« 22 » In his essay on the nature of time, Maturana (1995) wrote, "Living is a dynamics that disappears as it takes place." This is puzzling. How can living in an observer-dependent world be about disappearing rather than appearing? What does the dynamic of life hide and obscure from our view?

« 23 » An analogy between living and non-living matter may help us better understand what *the indistinguishable* is, according to Maturana. Let us envision a scenario: on a frigid night we left a bottle of water on the backseat of our car. The next morning, as we drive to work, thirst strikes us and we recall the water in the car. However, upon glancing at the backseat, we find not a bottle of refreshing liquid, but a solid mass of ice. The water we had last night has transformed, leaving us with something we cannot drink. In this moment, the water has become obscured; it is no longer visible, tangible, or even perceptible to our senses. The freezing temperatures have rendered the water absent from our immediate view. Therefore, all we can do in the rush of the moment is to "forget about" this water and quickly get another bottle before we are late for work. Our situation does not permit any other way of understanding what we have in the bottle: There is no water for us now; we are dealing with the change that made the water disappear.

« 24 » Yet, there is another perspective. Although the freezing temperatures affected the physical composition of the water, it does not mean that the water disintegrated and ceased to exist as water. Its organization remained intact and the "same" water can reappear if we take the bottle to the office and give it some time. Therefore, the water did not disappear anywhere, it is still in the bottle for somebody who will "rediscover" it later or/and recognize it now.

« 25 » This scenario serves as a metaphor for how organisms encounter their medium. Let us draw a parallel between the bottle of water and the body of a living system, with the transformation of water into ice representing the shifts an organism undergoes in response to its surroundings – much like a fan at a stadium during an exhilarating football match. In the first scenario with the driver rushing to work, the bottle is observed to change as a result of the frost in which it was left to an extent that the previous condition of the bottle (water contained in it) quite naturally disappears "into" a new one (ice). Similarly, consider the fan who immerses themselves in the vibrant atmosphere of the stadium; they momentarily forget their daily routine and synchronizes their actions and emotions with the exuber-

ant crowd around them, rallying in support of their team. In both instances, there is a dynamic interplay between change and perception. The organism adapts its bodily state in harmony with its surrounding dynamics that shape its internal experience. For the fan, the chanting crowd, the stadium, their sporting preferences and expectations – their manner of "fanning" – become their natural situation of existence. The transition from office routine to the football stadium does not disrupt their perceptual experience of the game; rather, it smoothens and enables it – the fan sees what they *want* to see, fully immersed in the fluidity of the lived experience.

« 26 » Continuing with the metaphor, we can explore how the second perspective broadens our understanding of both the bottle of water and the organism. While water has transformed from liquid to ice, the system, comprising the bottle and its contents, retains its identity despite the frost that has obscured its original state. This recognition allows us to see beyond mere appearances; we understand that the water, though currently solid, is still fundamentally water, awaiting a change in conditions to return to its liquid form. In a similar vein, consider the fan at the stadium who is recognized by an employee from their office who is watching the game on live television. To the employee, this moment is striking; they see the person they thought of as their boss, with whom they interact daily, now immersed in a completely different setting. This juxtaposition creates a sense of dissonance – the surroundings of the stadium seem foreign and incongruous compared to the office where they usually see their boss.

« 27 » To differentiate between these two versions of the unseen, Maturana distinguishes between two parts of the medium that any given organism can encounter. If we look at the medium as a space where what happens to the organism specifies what happens in the organism (and vice versa), it is its *niche*; if it is a space where these happenings are not mutually specified and depend on the perspective of an (outside) observer, it is its *environment*.

« 28 » As the term suggests, a *niche* is part of the medium that is specific to an individual organism. A niche emerges from and changes in every encounter of the organism with its medium. A niche does not pre-exist the relationships that the organism has, but is specified and operationalized by it, moment by moment (Maturana 1988). Interactions with the niche are invisible, or, in Maturana's terms, "obscured from the view of the observer by the presence of the composite unity" (ibid: 19). It means that the organism and its niche are perceptually inseparable. They cannot be taken apart, as they form a fluid ecological coupling, or "ecological organism–niche unity" (Maturana, Dávila & Ramírez 2016). This unity is similar to the way a motion picture is rendered on the screen as a congruent coupling of pictures and their motion. Such an organism–niche obscurity may explain why, in our daily interactions with certain people in a familiar setting, such as an office, we can struggle to imagine these people acting in another setting and being "other" people. As a result, we may be surprised to learn that our boss is a football fan because we do not see our boss's niche – *relations that change, or disappear, with that person's appearance (i.e., with their participation)*.

« 29 » The organism's *environment* is the organism's surroundings distinguished as such by the observer. It is not where and how the organism does what it does, it is *observed* as where and how the organism *observably* does what it does. This important dependence of an environment on the observer can be explained in the following way. An observer (from Latin *ob-* "in front" and *servare* "keep safe") is somebody who watches as something happens and does not interfere, staying "on guard" despite all changes. In a more naturalist sense, the observer sees what the observed organism does not (need to) see: She becomes part of relations and interactions obscured from the view of the observed organism but of which it is part through the spatio-temporal consequences of its doings. It need not know that there is something "out there," whereas the observer does. From such a perspective, the organism's environment is *a totality of relations that appears the same after the organism disappears*.

« 30 » An example of such a niche–environment asymmetry that is a source of the unseen can be our daily experience with pets. As we interact with our dog, we are aware that it cannot see things beyond its own niche; that is why the name of the place we are taking it to does not matter to the dog, what matters are the conditions for running, eating, playing, etc. it can encounter there. At the same time, we are aware that when the dog is not in this place, the place does not disappear in (our) relation to the dog. As a result, *the observer distinguishes what the observed organism does not experience (i.e., its environment) but does not distinguish what the observed organism does experience (i.e., its niche)*.

« 31 » Maturana's notions of obscurity (perceptual uncertainty or a prerequisite of it) tied to niche-environment asymmetry, as we interpret it, proves especially valuable in illuminating interactions between several organisms. If we assume, in line with Maturana, that our niche is what exists for us, every instance of interaction with another organism begins with the emergence of this living system from what already exists, from what Maturana referred to as the "background" (a totality of relationships that we have established with our niche) against which the organism is distinguished. Indeed, this background is nothing else but our niche and that part of the organism's environment that is within our niche; we perceive the appearance of the organism as a natural occurrence as long as we understand what we see is based on our relational background in congruence with the changing situation, much like a football fan transitioning smoothly between the office and the stadium settings. The organism begins to exist with us as part of our niche.

« 32 » At the same, the organism's own appearance becomes obscure, its emergence as if from nowhere, from its background of relations, is not and cannot be perceived and, therefore, distinguished. Instead, we observe the organism in a surrounding space that includes us, this organism and everything else that *we* know and see at that moment but the organism may not. As a result, we tend to assume that we see more than the organism does, which gives us a sense of epistemological privilege: we may be tempted to make sweeping judgments and commit fundamental attribution errors. If we take into account that another observer with whom we interact finds herself in the same perceptual condition, our assertion of "seeing more than" should requalify

into "not seeing as much as": we never see as much as what the organism including the other human does. Such a requalification in accordance with perceptual uncertainty has a number of ethical implications for us human beings who may want to engage in deception or dishonesty under the assumption that others do not see. The uncertainty of interaction opens the way for both the acceptance and denial of the other as well as what we can describe as accidents:

> "If the observer considers the system in a context by focussing on the system of processes that surround it, again there will be a wider context that he or she will not have considered, and the whole situation will be open for accidents." (Maturana 1998: 240)

« 33 » The indistinguishability as a perceptual form of uncertainty is not a flaw but rather a fundamental aspect of our interactions as observers: "the biological realization of our being continuously disappears from our view as an invisible background in our daily operation as human beings" (Maturana 1997). In Dewey's words, we are intricately woven into the fabric of the indistinguishable once we engage in an act of distinguishing, and there is a certain dialectic relationship between the seen and unseen:

> "The visible is set in the invisible; and in the end what is unseen decides what happens in the seen; the tangible rests precariously upon the untouched and ungrasped. The contrast and the potential maladjustment of the immediate, the conspicuous and focal phase of things, with those indirect and hidden factors which determine the origin and career of what is present, are indestructible features of any and every experience." (Dewey 1929: 43–44)

The unknowable

« 34 » Often, the appearance of another organism or object cannot be easily taken for granted, especially when we encounter a contradiction in our perceptual experiences and have to figure out the indistinguishable and/or the unseen. In this case, we experience an epistemological need for explanations; we feel that we have to account for where an observed item comes from. Yet, an explanation is but an act of disciplined imagination, because while indistinguishable processes do not have to occur at all, the observer assumes they do, or better, that they did or would. Such processes serve the observer as a background from and in which anything observable appears and which the observer needs as a basis for her explanations of what appears. This background can validate the coherences that the observer establishes between the observed processes "here and now." In other words, when something happens, we not only need to know what it does to us, but also what it is, or better, what it was. To Maturana, these questions are not similar in their epistemological outcome: If the former leads the observer to an expanded knowledge of her own experience, the latter misleads her into a totally unknowable *substratum of existence*.

« 35 » Maturana elaborates on the unknowability of such a substratum:

> "[T]he cosmos that we human beings generate in our explanations of our experiences as if it existed independently of our doings, arises in our doings immersed in a substratum that we cannot characterize, not even to claim that there is any resemblance between it and the cosmos that we describe and explain […] The background in which a system appears is indeed […] a domain of structural coherences about which the observer can say nothing before the appearance of the system… After the system appears, the background changes its character and becomes knowable through the system itself as this is used as an indicator of the characteristics of the background in which it arose." (Maturana 2007: 22f)

« 36 » What he most likely meant is that in an effort to explain the origin of a phenomenon, we not only assume the existence of the phenomenon prior to our observation, but also the existence of its source as a certain space where this phenomenon to be observed does not exist yet. What we end up doing is *imagining* the past as if there were no present (in it). We do so to make sure the coherences of our living make sense and we can explain where the phenomenon comes from. Epistemologically, we need this ground of origination as a proposition of certainty for all our experiences, although biologically they are groundless and happen to us as already coherent and ordered, spontaneously, literally out of nothing, out of nowhere. The historical background as a source (substratum) of what happens is a cognitive relation that we establish in the present based on our experiential coherences "in the comfort of living them as part of the known domain of experiential coherences" (Maturana 1995: 3). That is why phenomena come from what we imagine to exist but can never know.

« 37 » What exists in the substratum? As Maturana puts it, we cannot assert the existence of the substratum, as we would have to describe it, but descriptions bring forth things. There is "no-thing" in the substratum (no objects, no entities, no properties): "Nothing exists in the substratum" (Maturana 1988: 46). According to such a logic of consequentiality, the substratum is constituted by the absence of what we experience the moment we experience it. It is a plenum where the nameless nothing exists (Imoto 2005). This nameless nothing is not grounded on any experiential coherence, including that of the temporality with which we are operating at the moment of writing this sentence. The nameless nothing is not something to be named or cohered, nor is it something "unlanguaged" or "inexperienced." It is not something at all, it is as if it were chaos that cannot arise, because for it to arise, it needs to be named and experienced.

« 38 » Why do we think we can or need to know the substratum? Maturana does not give a definitive answer, but when he revisits the notion of time in his later work (Maturana 2008b), he is quite explicit about the paradox of our cognition: We cannot speak of what there is, but we speak "what there is" as it becomes so in our speaking. In other words, as soon as we use words to cohere our experiences, we enter the domain of temporality, as words are our temporal experiences and whatever we use them for becomes temporal by default (i.e., finite, sequential, predictive, bounded or unbounded, etc.). Maturana argued that time is an explanatory proposition for the arising of our being in no-time or time-zero. It means that everything happens in the instant that it happens, as it is happening, but our linguistic invention of time makes this happening either the beginning or end of some occurring process and connects the otherwise unrelated in-

stances of the process into a nameable (explainable) experience. Thus, in everything we do and/or say, we need the beginning, the foundation, the substratum of existence. As pointed out by Dewey (1929: 12f),

> "[T]he natural and original bias of man is toward the objective; whatever is experienced is taken to be there independent of the attitude and act of the self. Its 'thereness,' its independence of emotion and volition, render the properties of things, whatever they are, cosmic."

« 39 » We will give an example to illustrate how we, in search of certainty about the beginning of things, fail to know things as they are/were. Let us imagine a fifteen-year-old boy named John. John grew up in the warmth of a loving mother whose unwavering presence has painted his childhood with happiness and nurtured his spirit every step of the way. One day he learns that he is an adopted child. In his perception here and now, his past as a foundation of his existence changes its quality. It appears to him that his mother has not been there all the way, or he was not cradled in the "real" warmth of his "real" mother, or his childhood is (was) not as happy. He is not the John he thought he was before he learnt the news. His perception of himself and his mother as well as his childhood memories change because of the way he describes them now. In an effort to explain who he is by who he was, John unwittingly identifies the present explanation with the past explained. What seems to him is that his past re-emerges in a new way. Yet, what emerges are new experiences of hearing what others say now rather than old experiences of what was then. His past remains his past, a domain of relations unaffected by how he feels and what he knows now, i.e., a domain in which he was who he was irrespective of what he knows about himself now. In other words, this domain is totally unknowable for John now, because he cannot cancel what he knows now and how this makes him feel about what he knew then. His past has become a consequence of his present, although he believes otherwise as a substratum seeker who is entrapped to take names and descriptions as the origin of phenomena.

« 40 » Why is the substratum unknowable? When we are explaining, or proposing a generative mechanism of, a phenomenon, we find ourselves in the domain of its consequences and not of its causes. Whatever we do with the phenomenon, we do after it has taken place. Our consequential doings are our explanations if these doings evoke (again, as a consequence) the phenomenon and the condition of its occurrence in a way that we accept here and now. Therefore, the nature of any act of explaining is such that the explained is the consequence of, not a prerequisite for, the explanation. As soon as we attempt to know how it was, we do it in terms of how it is (or better, how it becomes) and lose the substratum; that is why "nobody knows, nor ever will know how it was, because 'as it was' is gone forever" (Foerster 2003: 297). As a result, what explains our living is our explanation and nothing else. In the section that follows, we will elaborate on this recursive principle of our operation in light of uncertainty that arises as a correlation between our knowledge and the constraints that our biology puts on knowing.

The inoperable

« 41 » In the 1950s, Maturana began as a neurobiologist who studied color vision in the pigeon from an "ordinary" scientific perspective of objectivity (Imoto 2011: 327). It took him about ten years to change this perspective into an "extraordinary one" (ibid) so that his colleagues thought he "had become crazy" (Maturana 2012: 158). Maturana dismissed as impossible what they believed and many still believe occurs in the phenomenon of perception. He accepted that color vision is not constituted by a correlation between the activity in the retinal ganglion cells and the spectral composition of the colored stimuli. Any correlation of such a kind is an operative impossibility, because neither can the retina operate with the spectral wavelength, nor can the spectral wavelength operate with the retina. Instead, the eye operates with the *consequences* of what it is triggered by. The colored stimulus affects the retina, but the retina operates with the effects of this stimulus rather than the stimulus itself. Such an effect is a discrimination that the affected organism makes between the components of its environment. In humans, this discrimination is the color distinguished as a name (Maturana, Uribe & Frenke 1968; Maturana 1983, 2012).

« 42 » This insightful revelation was a precursor of an ecological perspective on cognition developed later by Gregory Bateson (1972), Ulric Neisser (1976) and James Gibson (1979), who argued that we see only what we (are coming to) understand. Maturana added an agnostic angle to this ecological argument: We cannot deal with the "surrounding world," we can only deal with the effects it has on us. These effects are operable through our ways of sensing and moving. If any correlation is established, this is not a correlation between us and the "world," but between these two modalities of experience. In humans, these correlations become recursive and evolve into language.

« 43 » In very simple terms, sensorial processes inside an organism gives rise to movements that "happen" to it. Accordingly, what it does as a composite unity, i.e., how it encounters its medium, is the result of the operation of its sensory-effector neural components. However, this is not reversible: Components cannot operate as a result of what the composite unity does. Specifically, what happens to the organism as a system cannot participate in the neural dynamics that happens in it. Neither doings nor feelings happen to/in our nervous system but, rather, they are generated by its workings. In the same way, our doings (behavior) and whatever they entail cannot happen to/in our feelings because doings are the consequences of what and how we feel. Our behavioral results neither need nor have attributes of the enabling processes. Our neurons cannot be "upset" nor can we "fire" as our neurons. Processes and their results happen in separate, non-intersecting *domains*.

« 44 » When several things cohere, we say that something works, which means that we reveal a new regularity between these things and can use them in a qualitatively different way – as a togetherness of several things. Maturana says that such a coherence gives rise to a new domain of relations or operations. Yet, it does not mean that prior to this revelation of coherence, things did not fit or did not cohere. They did, but "in their own way." They were "consistent with themselves" (Maturana 2012), but now they are consistent with more than that, namely,

our newly revealed way of using them or fitting them together. Once we have revealed such a coherence, we cannot access the previously uncohered things, because we are operating in the domain of their irreversible coherence. Domain is a boundary that defines which relations can and cannot happen, what we can and cannot do based on the nature of these relations and our doings. For example, when we put oranges into the juicer, we are operating in the domain of "oranges-plus-something-else" relations. Once we get orange juice, we are operating in the domain of "juice-plus-something-else" relations. The second domain (the domain of the result) does not allow us to operate with "oranges-plus-something-else" relations (the domain of the process) as we have to start from what is operationally available, i.e., juice. In this case juice, not oranges, is our "source domain" that we can only proceed from. We cannot access what is inside the juice we are drinking, neither can we operate with the oranges it is made of – rather we can access and operate with what this juice affords, i.e., taste, but the taste of juice, not the oranges that went into it (Druzhinin 2025b). This example of moving from the process to its result shows that the result (juice) does not determine the process (squeezing oranges).

« 45 » Maturana's account of the inoperable can be summarized in the following propositions. Nothing is inconsequential in the flow of living. Consequences of our living make our medium operable. Triggered by the medium on the sensory-effector surface of our operating, we operate with the results of our operating that open up new domains of operating. We cannot operate

- merely with our operating,
- with the results of our non-operating,
- with (the results of) not our operating.

This principle of consequentiality makes living a recursive affair in which an organism does what it does (not what others want or claim it to), scientists explain what they explain (not an objective reality), a hearer hears what she hears (not what the speaker says), etc. In these seemingly tautological terms, one can tell and show how the biology of living separates the operable from the inoperable. Namely, an organism does what *results from its doing*, scientists explain *the coherences of their living with the coherences of their living*, a hearer hears *the consequences of her experiences of hearing*. No matter how certain we are about the occurrence of processes, they do not have the attributes we ascribe to them because our attributes – how we feel, what we think and know about processes – are not part of their constitution, but the consequences of *their* occurrence in *our* operational domain.

Conclusion

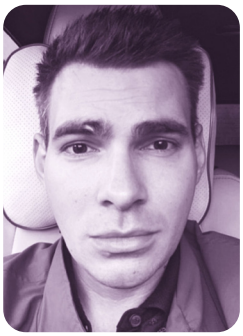
« 46 » Our analysis of agnostic claims explicitly made by Maturana and those that can be inferred from his philosophy is an attempt to delimit what can be known, distinguished and done the moment an observer begins to operate with distinctions in her cognitive domain. Based on the biologic account of knowing and perceiving, we have outlined the biological-cultural enabling constraints of not knowing, not perceiving and the inability to do either. With this aim, we have categorized them as the known, unknown, indistinguishable, unknowable and inoperable, which we treat as cultural, situational, perceptual, epistemological, and as biological correlations with uncertainty.

« 47 » Our analysis allows us to formulate some foundational principles of uncertainty from the biocognitive perspective. First, uncertainty becomes a cultural constraint on our experience of the inability to predict the occurrence of processes. In our culture dominated by relations of power, we know that it is not good and even not natural not to know something, which makes us feel uncertain about uncertainty. Second, uncertainty as the observer's distinction can also be correlated with a situational constraint that, on the one hand, enables a living system to experience what is present, and on the other leaves some aspects of this experience unknown. The living system finds itself doing what it does as a composite unity within the neighborhood (local, linear) relations that its composition permits. As a primary source of what happens in and to it, the living system cannot (be observed to) know or control any other sources of what happens. Third, uncertainty correlates with a perceptual condition of interaction between the observer and another living system. When two or several observers interact, their appearance in relation to one another is determined by how they distinguish one another against all other distinctions that surround both the distinguisher and the distinguished and serve as a background for the interaction. The appearance of the distinguished organism happens in accordance with the coherences of the distinguisher, not the distinguished. This condition makes indistinguishable much of the background of the interaction or even the interaction itself, e.g., when one organism-niche unity becomes spontaneously contingent on another observer's environment. Fourth, uncertainty can arise from and lead to an epistemological need of the observer to establish the source of what happens to her as if beyond what is or can be observed, thereby explaining phenomena, unaware that these explanations are coherences constructed *a posteriori* while in language. At the same time, language is how the observer accepts (the existence of) things *a priori* (Druzhinin 2025a; Druzhinin & Ramirez 2025). Finally, uncertainty is traced to the biology of every living system observed in its medium as a closed structure-determined entity operating with the consequences of its operation in the domains that arise with these consequences and do not intersect with the domains from which these consequences arise. Such a mode of operation can be described as uncertain because what happens in the system cannot be predicted by or deduced from what happens to the system (and vice versa); otherwise the system would not be able to conserve its organization and remain distinct from other entities that can be distinguished by the observer.

« 48 » The results of our analysis contribute to cross-disciplinary studies of uncertainty, in general, and the constructivist approach to agnosticism, in particular. First, by establishing that gaps in knowledge arise from the consequential structure of recursive biological processes that are open-ended and at the same time closed upon themselves, we illuminate the ecological character of uncertainty. Upon this view, what an agent fails to control, know or do, in general, is determined not by the external environment or the inner works of her body or brain, but by the system of all these processes that arises consequentially and



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operates as a whole within its own structural constraints. The idea of systemic consequentiality of both the known and the unknown is potentially insightful for studies on cognitive ecology or ecological cognition within ecolingusitics, biosemiotics and beyond. Second, along the lines of constructivism, our biocognitive analysis of uncertainty continues a series of works on critical cybernetics (Scholte & Sweeting 2022; Krippendorff 2023; Westermann 2023; Scholte 2023) that help illuminate and deal with relational problems of cultural and linguistic origin (Dávila 2011, Kravchenko 2016; Fomina 2024; Druzhinin & Rakedzon 2024). Lastly, perhaps, we can make a little progress in our search for the answer to Maturana's (2015: 179) big question:

> "How was it possible and is it still possible in our human social history that we have repeatedly fallen and we are still repeatedly falling out of our social beingness, even though we are aware and know that our social beingness is the basic foundation of our humanness?"

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