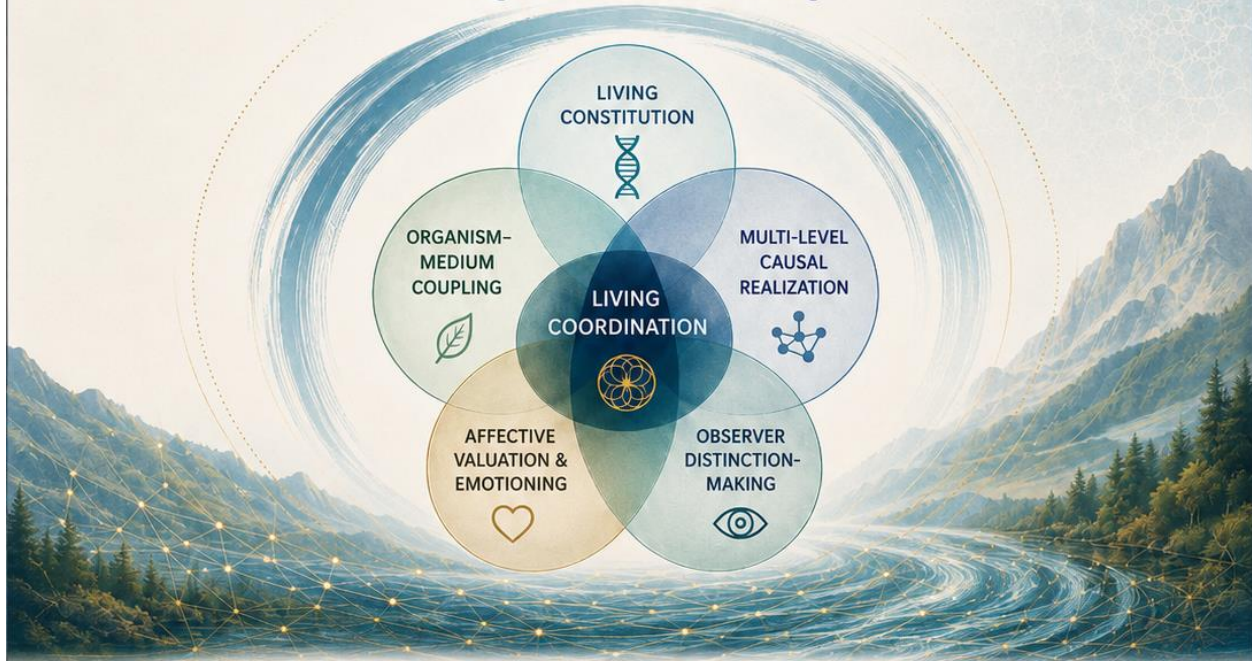


The Biology of Living Coordination

AUTOPOIESIS, BIOLOGICAL RELATIVITY,
EMOTIONAL SENTIENCE, AND THE
OBSERVER'S DISCIPLINE OF DISTINCTION

*Toward a Life-Coherent Science of
Organism–Medium Living*



*The organism does not belong to our framework.
Our framework must remain answerable to the organism.*



Dr. Bichara Sahely

BSc (Hons) Biology, MBBS, DM (Internal Medicine)



Academic White Paper
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Abstract

This white paper proposes **the biology of living coordination** as a generative domain of inquiry for understanding life without reducing it to mechanism, physiology, subjective experience, emotion, culture, or observer-made categories alone. Its central concern is how living systems conserve organization, change structure, enact worlds, evaluate what matters, coordinate action, and generate explanations within histories of organism–medium coupling.

The inquiry is grounded in three complementary bodies of work. Humberto Maturana's biology of autopoiesis and cultural biology discloses the living being as a molecular autopoietic system that exists only in the conservation of its relation with a dynamic ecological niche. Denis Noble's Biological Relativity provides the causal architecture: no biological level has causal sovereignty, because living function is realized through reciprocal boundary conditions across molecular, cellular, tissue, organ, organismic, ecological, and social levels. Katherine Peil Kauffman's work on emotional sentience restores the affective-evaluative dimension of living agency, showing emotion as a self-regulatory sense through which organisms feel, evaluate, approach, avoid, preserve, and develop.

The paper organizes this inquiry around five domains of distinction: **living constitution, organism–medium coupling, multi-level causal realization, affective valuation and emotioning, and observer languaging and distinction-making**. These domains are not treated as separate compartments or final truths, but as disciplined ways of seeing how living processes mutually imply one another without collapsing into one explanatory sovereign.

The paper argues that physiology remains necessary but insufficient when isolated from organism–medium coupling, emotioning, languaging, and observer participation. It also argues that emotion is not merely private psychological content, but a valenced organization of possible

action in the organism–medium unity. Health is reframed as coherent transition; disease as discoordination, narrowing, or locked transition; healing as restored movement; care as structural coupling; public health as protection of living conditions; and civilization as an extended niche that may become salugenetic or pathogenic.

The aim is not to offer a closed theory of life, but a disciplined grammar for inquiry. Its guiding commitment is that living systems must not be forced to fit our distinctions; our distinctions must remain answerable to life.

Keywords

autopoiesis; biological relativity; living coordination; organism–medium coupling; organism–niche unity; dynamic ecological niche; emotioning; emotional sentience; affective valuation; structural coupling; physiology; observer; languaging; distinction-making; life-coherence; wu-wei; living systems; organism-centered biology; systems biology; cultural biology; health; healing; public health; civilization

Executive Summary

This white paper proposes a new domain of inquiry: **the biology of living coordination**.

The inquiry begins with a pause. Life should not be reduced too quickly to genes, mechanisms, physiology, brains, systems, emotion, cognition, culture, subjective experience, or observer-made categories. Each of these distinctions matters, but none is sufficient by itself. The living being exceeds every single distinction made about it. The task is therefore not to impose a new master category, but to distinguish the domains through which living can be more faithfully understood.

The first guiding thinker is **Humberto Maturana**. His work establishes the living being as an autopoietic unity: a system that continuously produces and conserves the organization that makes it alive. More radically, Maturana shows that the organism does not live in an abstract environment. It lives only in a dynamic ecological niche that arises with its living. Organism and niche are therefore understood as a dynamic ecological organism–niche unity. This makes life fundamentally relational without dissolving the organism into its surroundings.

Maturana also gives the inquiry its epistemological discipline. Observers do not stand outside life looking at it from nowhere. They make distinctions in language, within emotioning, for purposes of action and explanation. Scientific categories are therefore not rejected, but they must be held with humility. They are instruments, not possessions.

The second guiding thinker is **Denis Noble**. His principle of Biological Relativity shows that no single level of biological organization has causal sovereignty. DNA, proteins, cells, organs, organisms, ecologies, and social worlds all participate in multi-level causation. The form of a system supplies boundary conditions for its components, and those components participate in the realization of the system's form and function. This prevents the inquiry from becoming vague holism, because it requires disciplined attention to mechanisms, boundary conditions, reciprocal causation, and functional integration.

The third guiding thinker is **Katherine Peil Kauffman**. Her work on emotional sentience brings into view a dimension often missing from both physiology and systems biology: the felt valuation of living. In her account, emotion is not merely a human psychological experience, but an ancient self-regulatory sense through which organisms detect, evaluate, and respond to what matters for their living. Feeling and action tendency belong together: pleasure and pain, approach and avoidance, preservation and development.

Together, these three thinkers disclose a wider field. Maturana shows that life is autopoietic and organism–niche constituted. Noble shows that living is causally realized through multi-level biological relativity. Kauffman shows that living agency is affectively valenced: the organism does not merely interact with its world; it feels, evaluates, approaches, avoids, remembers, and develops through what matters to it.

The white paper proposes five foundational domains of distinction.

The first is **living constitution**. This asks what must be conserved for a living unity to continue living. The central distinction is that structure changes, while organization must be conserved.

The second is **organism–medium coupling**. This asks how the organism exists in relation with the medium that makes its living possible. The environment is not a passive external container; it becomes a niche through the organism's living, sensing, acting, and history of structural coupling.

The third is **multi-level causal realization**. This asks how living is enacted through molecular, cellular, tissue, organ, organismic, ecological, and social levels. This is where physiology, systems biology, and medicine remain indispensable.

The fourth is **affective valuation and emotioning**. This asks how the organism feels, evaluates, and enacts what matters. Emotioning is not treated as a secondary mental event. It is the valenced relational tone through which worlds of action become possible or impossible.

The fifth is **observer languaging and distinction-making**. This asks what distinctions are being made, from what emotioning, for what action, and with what consequences. This domain keeps the inquiry reflexive and prevents “living coordination,” “life-coherence,” or any other term from becoming a new rigidity.

The resulting field may be called **the biology of living coordination**. It studies how living unities conserve organization, change structure, respond to perturbation, enact worlds, feel what

matters, coordinate action, and bring forth explanations within histories of organism–medium coupling.

The practical implications are wide. Health becomes the capacity for coherent transition. Disease becomes discoordination, narrowing, overload, or locked transition. Healing becomes restored movement. Care becomes part of the causal field, because clinical encounters alter the organism–medium niche. Public health becomes protection of the conditions under which living systems can conserve organization, develop, repair, and participate. Civilization becomes an extended niche that may be salugenetic when it protects living conditions, or pathogenic when it normalizes chronic perturbation and then medicalizes the consequences.

The paper also introduces **wu-wei** as a practical posture of non-forcing participation. Wu-wei does not mean non-intervention. It means action proportionate to the living situation, guided by the system’s constraints, margins, timing, and next possible transition. The principle is to use the minimum sufficient force required to protect living and open the next coherent movement.

The framework remains deliberately provisional. It does not claim that all biology is reductionist, that emotion explains everything, that subjective experience replaces evidence, or that disease is always meaningful in a comforting sense. It does not reject biomedicine, physiology, diagnosis, or mechanism. It seeks to situate them within a wider living field.

Its deepest methodological commitment is this:

Life must not be forced to fit our distinctions; our distinctions must remain answerable to life.

The aim is not to control life from above, nor reduce it from below, but to participate more wisely in the conditions under which living coordination can continue, repair, and flourish.

Author Note

This white paper is part of a broader life-coherent medicine and systems-health project seeking to reconnect biology, physiology, clinical practice, public health, ecology, culture, and civilizational design around the conditions that allow living beings to conserve coherence, repair injury, and participate meaningfully in the world.

The framework is offered as an integrative theoretical and practical grammar, not as a replacement for established biological sciences, diagnostic categories, validated disease classifications, or evidence-based treatment. Its purpose is to support more disciplined inquiry into how living systems conserve organization, change structure, enact worlds, evaluate what matters, and remain open to healing, development, and participation.

Suggested Citation

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Epigraph

The organism does not belong to our framework.
Our framework must remain answerable to the organism.

Prefatory Note

Why This Inquiry Must Not Be Forced

This white paper begins with a methodological pause.

The temptation, when a powerful set of distinctions appears, is to organize them too quickly. One may wish to call the field physiology, systems biology, organism-centered medicine, affective biology, enactive cognition, life-coherence, or something else. Each name reveals something. Each also risks concealing something.

Physiology is necessary, but if taken alone it may narrow the inquiry to mechanisms inside the body. Systems biology is necessary, but if taken alone it may model relations without sufficiently honoring the living unity. Phenomenology is necessary, but if taken alone it may lose the biological organization through which experience is enacted. Emotion is necessary, but if taken alone it may be psychologized or detached from the organism's living. Culture is necessary, but if taken alone it may obscure the molecular autopoietic conditions under which human culture exists.

The work therefore begins by refusing premature sovereignty to any one domain.

Maturana, Noble, and Kauffman each open a different window. Maturana opens the window of autopoiesis, organism–niche unity, emotioning, languaging, natural drift, and observer discipline. Noble opens the window of biological relativity, multi-level causation, functional integration, and boundary conditions. Kauffman opens the window of emotional sentience, affective valuation, self-regulatory feeling, and living agency.

The task is not to force these windows into one doctrine. The task is to stand where their light overlaps and ask what becomes visible.

What becomes visible is living coordination.

A living being conserves itself while changing. It remains itself while exchanging matter, energy, signals, and relations with a medium. It senses, evaluates, moves, repairs, remembers, learns, and participates. It is not merely pushed by causes from below or commanded by programs from above. It lives in a field of coordinations: molecular, cellular, tissue, organ, organismic, ecological, affective, relational, linguistic, and cultural.

The observer who studies this living also participates in a domain of coordination. The scientist, clinician, theorist, patient, and citizen do not merely describe life. They make distinctions that guide action. Those distinctions can open or close possibilities. They can bring care, precision, humility, and repair. They can also bring reduction, domination, dismissal, and harm.

This paper therefore proceeds with one guiding discipline:

Every distinction must remain in service of better seeing, more responsible action, and the conservation of living possibility.

The work is not being forced into a final system. It is being allowed to appear as a disciplined inquiry into how life coordinates itself, and how human beings may learn to coordinate with life more coherently.

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Part I — The Need for a New Domain of Inquiry

1. From Mechanisms of Life to Living Coordination

Modern biology and medicine have achieved extraordinary power by distinguishing parts, mechanisms, pathways, signals, systems, genes, molecules, tissues, organs, and regulatory processes. These distinctions have transformed human understanding and clinical practice. They allow physicians to diagnose disease, scientists to investigate causation, and public health systems to intervene in conditions that once produced immense suffering.

Yet every act of distinction carries a risk. What is distinguished may begin to appear more real than the living process from which it was abstracted. The gene may appear to command the organism. The brain may appear to generate the person. The immune system may appear to wage war. The body may appear to function as a machine. Emotion may appear to be a psychological disturbance. Culture may appear external to biology. The observer may appear to stand outside the world being observed.

The biology of living coordination begins from a different place. It begins from the living being as a self-producing unity that exists only in relation with a medium in which its living can continue. The organism is not first an isolated object and only later a participant in an environment. It is always already living in a relational field that makes its living possible or impossible. Maturana et al. (2016) describe living systems as molecular autopoietic systems that live only while the medium provides the conditions for the realization and conservation of living, and they further argue that human conversations, explanations, reflections, and theories become part of the ecological niche itself.

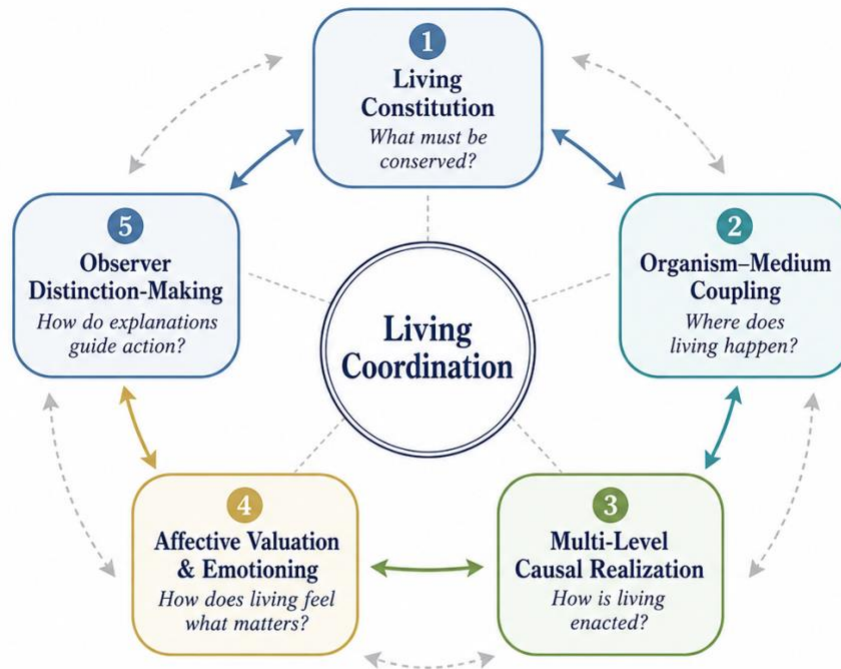
From this starting point, the central question changes. We no longer ask only, “How does the body work?” We ask a wider question:

How does living remain possible through changing coordinations of body, medium, feeling, action, language, and distinction?

This question does not reject mechanism. It requires mechanism, but refuses to let mechanism become the whole of life. It does not reject physiology. It deepens physiology by situating it within the organism–medium unity. It does not reject emotion. It asks how emotioning participates in the valenced organization of living action. It does not reject culture. It asks how human languaging, care, institutions, technologies, and explanations become part of the living niche. It does not reject objectivity. It asks the observer to become responsible for the distinctions through which objectivity is enacted.

The name proposed for this wider inquiry is **the biology of living coordination**. Its concern is the historical, embodied, affective, relational, and multi-level process through which living systems conserve organization, change structure, enact worlds, feel what matters, coordinate action, and generate explanations within histories of organism–medium coupling.

Figure 1. The Five Domains of Living Coordination



The biology of living coordination is organized around five distinguishable but inseparable domains: living constitution, organism-medium coupling, multi-level causal realization, affective valuation and emotioning, and observer distinction-making. The figure avoids a hierarchy: no domain is sovereign. Instead, each domain helps disclose how living systems conserve organization, change structure, enact worlds, evaluate what matters, coordinate action, and generate explanations within histories of organism-medium coupling.

Living coordination is not proposed as the hidden essence behind all biological phenomena. It is proposed as a domain of disciplined attention: a way of holding together living constitution, organism-medium coupling, multi-level causation, affective valuation, and observer-made distinction without granting sovereignty to any one of them.

This field is not offered as a replacement for existing sciences. It is offered as a domain in which existing sciences can be re-situated so that they remain answerable to life.

2. Why Physiology Is Necessary but Not Sufficient

Physiology remains indispensable because living is not an abstraction. It occurs through bodies, membranes, gradients, channels, flows, cells, tissues, organs, repair systems, metabolic pathways, electrical rhythms, endocrine patterns, immune regulation, neural coordination, and organismic action. Without physiology, any account of life risks becoming metaphorical, ethical, or phenomenological without causal grounding.

Denis Noble and Reine Bourret give this causal grounding through the principle of Biological Relativity: no biological level has causal sovereignty, because living function depends on reciprocal causation and boundary conditions across levels. The form of the system supplies

boundary conditions for lower-level processes, while lower-level processes participate in the realization of higher-level form and function.

Biological Relativity should not be read as a vague assertion that all things are connected. Its force lies in the disciplined claim that biological function is realized through reciprocal boundary conditions across levels, so that no level can explain living causation by itself.

This insight is crucial. It means physiology already points beyond reductionism. A living cell is not a bag of molecules commanded by DNA. It is a dynamic unity in which membranes, cytoplasm, proteins, RNAs, repair systems, energy gradients, and functional networks participate in the ongoing realization of living. DNA is indispensable, but it is not sovereign. Noble and Bourret (2026) explicitly argue that the Central Dogma becomes incomplete when DNA is treated as a one-way causal controller, because accurate replication and biological function depend on living cellular networks and top-down control. It is read, repaired, marked, expressed, silenced, reorganized, and interpreted inside the living system.

Physiology is therefore the science of coordinated function across levels.

Yet physiology, if narrowly framed, may still remain insufficient. It may describe internal function while leaving the organism's medium, history, emotioning, languaging, and cultural existence outside the frame. It may explain stress hormones without asking what world of threat is being lived. It may describe inflammation without asking what boundary relation has become disturbed. It may measure autonomic tone without asking what relational domain of action is being conserved. It may treat emotion as a downstream neural event rather than as part of the organism's living coordination.

To say that physiology is not sufficient is not to diminish physiology. It is to free physiology from reduction to internal mechanism alone and to restore it as the causal study of living function within the organism–medium field.

The biology of living coordination does not abandon physiology. It relocates physiology. Physiology becomes the domain of **multi-level causal realization** within a wider living field.

Living is causally enacted through physiological processes, but it is not exhausted by those processes. Living is also organism–medium coupling, affective valuation, emotioning, languaging, history, and observer-made distinction.

3. The Danger of Possession by Distinction

Every science begins by making distinctions. A distinction separates one domain from another so that something can be seen, named, studied, measured, communicated, and acted upon. Without distinctions, there is no inquiry.

But with every distinction comes the danger of possession.

Possession by distinction occurs when the observer forgets that a category is a tool and begins to treat it as the living process itself. The gene becomes “the cause.” The diagnosis becomes “the patient.” The biomarker becomes “the truth.” The model becomes “the system.” The theory becomes “the world.” The emotion becomes “irrational noise.” The observer becomes invisible.

This danger is strongest when distinctions work. Genes do matter. Cytokines do matter. Neural circuits do matter. Hormones do matter. Diagnostic categories do matter. Mathematical models do matter. Their usefulness can seduce the observer into forgetting their incompleteness.

Maturana’s discipline is essential here. The observer does not access a world from nowhere. The observer operates through distinctions in language, in living, in emotioning, and in communities of explanation. This does not make science arbitrary. It makes science responsible.

To keep the observer visible is not to abandon reality. It is to acknowledge that reality is approached through distinctions, instruments, practices, communities, and emotioning that must remain accountable to consequences.

Scientific distinctions are not invalid because they are observer-made. They are valid insofar as they coordinate coherent operations, disclose reliable regularities, and support responsible action. But they become dangerous when treated as possessions.

This paper must therefore apply its own warning to itself. “Living coordination” is also a distinction. So are “autopoiesis,” “biological relativity,” “emotional sentience,” “organism–medium unity,” “emotioning,” “life-coherence,” and “wu-wei.” They may open a wider field, but they can also harden into a new vocabulary of control if held without humility.

The test of a distinction is not whether it sounds profound. The test is whether it improves seeing, deepens responsibility, and helps action remain answerable to life.

Part II — Three Foundational Windows

Figure 2. Three Foundational Windows onto Living Coordination

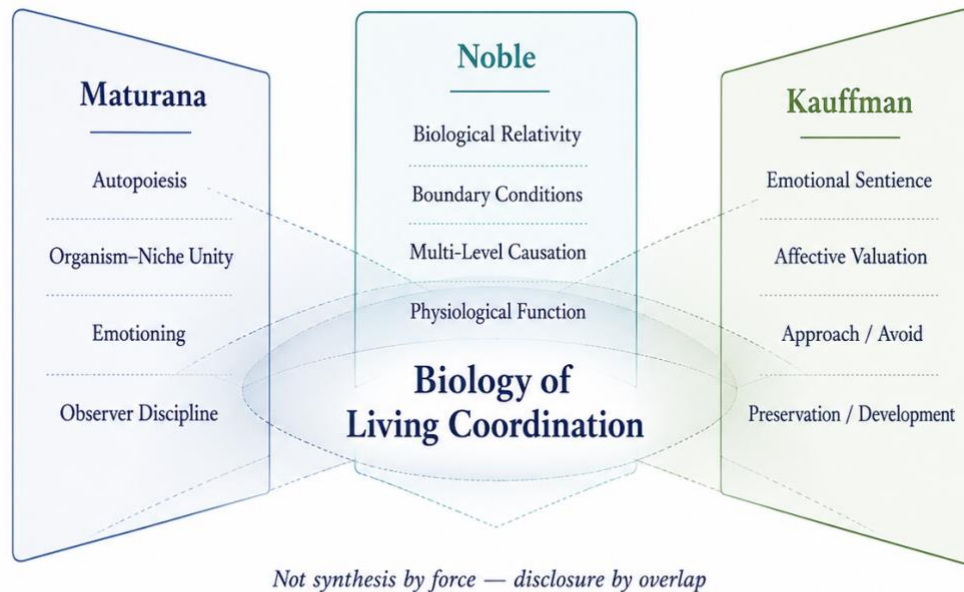


Figure 2. Three Foundational Windows onto Living Coordination. Maturana, Noble, and Kauffman open different but complementary domains of inquiry. Maturana contributes the living ontology of autopoiesis, organism–niche unity, emotioning, and observer discipline. Noble contributes the causal architecture of Biological Relativity, boundary conditions, and multi-level physiological realization. Kauffman contributes the affective-evaluative dimension of living agency through emotional sentence. Their overlap discloses the wider domain of living coordination without collapsing their distinctions into a single doctrine.

4. Maturana: Living Constitution, Organism–Niche Unity, Emotioning, and the Observer

Maturana’s contribution begins before physiology, cognition, culture, and medicine. It begins with the question of what kind of unity a living being is.

A living being, in Maturana’s biology, is not primarily an object with properties. It is a molecular autopoietic system: a unity that continuously produces and conserves the organization that makes it a living unity. Maturana et al. (2016) explicitly frame living systems as molecular autopoietic systems and develop the concept of the dynamic ecological organism–niche unity. Its components change; its organization is conserved. Its structure transforms; its living continues only as long as the organization of autopoiesis is conserved.

Autopoiesis is not used here as a general metaphor for complexity. It names the living organization whose conservation distinguishes a living unity from a non-living aggregate, mechanism, or system of external control.

The distinction between **organization** and **structure** is decisive. Organization refers to the configuration of relations that gives a unity its class identity. Structure refers to the actual components and relations that realize that organization at a given moment. A living system may undergo continuous structural change while conserving the organization that makes it alive. If that organization is no longer conserved, the living unity disintegrates.

Living is therefore ongoing conservation through change.

Maturana's later cultural-biology work deepens this with the distinction of **dynamic architecture**. A living being is not a fixed architecture, but a history of transformation in a sensory–operational–relational domain. What may appear to an observer as purpose, control, regulation, or design can instead be understood as the historical harmony of dynamic architectures arising through structural coupling and natural drift.

The living organism, however, never exists alone. It exists only in relation with a medium in which its living is possible. Maturana therefore introduces the distinction of the **dynamic ecological organism–niche unity**. The niche is not merely an external environment already waiting for the organism. It arises with the organism's living. Organism and niche change together congruently while the organism's molecular autopoiesis is conserved.

This is one of the most important distinctions for the biology of living coordination. It means that the primary unit of inquiry is neither the isolated organism nor the external environment, but the living relation in which organism and niche arise together.

The organism does not receive a pre-given world. It lives a world. It brings forth a domain of relevance through sensoriality, action, and history of coupling. What counts as food, threat, shelter, signal, mate, toxin, invitation, sound, meaning, or danger depends on the living organization of the organism and its history in the medium.

This is not subjectivism. It is biological relationality.

Maturana's natural drift deepens this further. Evolution is not primarily competitive optimization toward progress, perfection, or superiority. It is the historical conservation and diversification of manners of living through the conservation of organism–niche coherence. Lineages persist when manners of living are conserved through systemic reproduction; they end when the conditions for their conservation fail. Maturana et al. (2016) also argue that evolutionary diversification occurs through differential survival in a changing medium by conservation of adaptation, not simply by competitive survival of the "best."

This reframes adaptation. Adaptation is not a goal achieved by an organism. It is the ongoing conservation of a relation in which living remains possible.

Maturana also gives this project its epistemological guardrail. The observer does not stand outside life. The observer distinguishes, languages, explains, and coordinates action from within living. Explanations are not views from nowhere; they arise within the observer's operations of distinction.

This does not dissolve science. It disciplines science.

The observer must ask: What distinction am I making? In what emotioning? For what action? What does this distinction open? What does it obscure? What happens to living systems when this distinction guides medicine, education, policy, economics, or care?

Without Maturana, the biology of living coordination could collapse into systems physiology or mechanism. With Maturana, it remains answerable to living as lived.

5. Noble: Biological Relativity and the Multi-Level Causality of Living Systems

If Maturana gives the living ontology, Noble gives the causal architecture.

Noble's central contribution is the principle of **Biological Relativity**: there is no privileged level of causation in biological systems (Noble & Bourret, 2026). Noble and Bourret (2026) identify Biological Relativity as the central principle of systems biology, with the other principles deriving from it. No single level — not DNA, proteins, cells, organs, the brain, the organism, or the environment — can claim causal sovereignty over the rest.

This principle is not a rejection of molecular biology. It is a correction of molecular sovereignty.

Noble and Bourret argue that living systems require multi-level causation because lower-level processes occur only within higher-level forms and boundary conditions. The form of the system is not a decorative consequence of molecular activity. It is necessary for integrating the processes through which the system functions.

Their critique of the Central Dogma is not that DNA is unimportant. DNA is indispensable. The error lies in treating DNA as if it were the unilateral controller of life. DNA does not produce the organism from outside the living process. DNA participates within the living unity.

This is profoundly compatible with Maturana. The genome is not the architect standing outside the living system. It is a molecular resource inside the autopoietic unity, read and regulated by cellular and organismic networks.

Noble's concept of **boundary conditions** is especially generative. Boundary conditions are not merely limits. They are forms within which processes become possible. A molecule behaves differently inside a cell than in a test tube. A cell behaves differently inside a tissue than in isolation. An organ functions differently inside a living organism than in abstraction. An organism lives differently in safety than in chronic threat. On this view, system form creates boundary conditions that make lower-level mechanics integrable within living function (Noble & Bourret, 2026).

The Hodgkin cycle provides a classic illustration. Ion channels help generate membrane voltage, while membrane voltage regulates ion-channel behavior. The cell-level condition and molecular-

level behavior are mutually determining. Neither level alone explains the phenomenon. The rhythm depends on reciprocal relation.

This is the physiological meaning of living coordination.

The part participates in the whole. The whole constrains the part. The relation is simultaneous, recursive, and dynamic.

Noble also restores **function** as central to biology. In living systems, functions are not merely descriptions imposed after the fact. They are processes that matter for the conservation of living. Breathing, circulation, immune recognition, sleep, metabolism, repair, reproduction, communication, and movement all matter because they participate in the organism's continuing viability.

Without mechanism, the inquiry becomes vague. Without function, it becomes lifeless.

Noble's place in this white paper is therefore precise: he gives the domain of multi-level causal realization. He tells us how living coordination can be enacted without reducing it to one level. He gives the grammar of levels, boundary conditions, functional networks, downward and upward causation, stochasticity, robustness, and organismic openness.

But Noble does not by himself give the whole domain. Biological Relativity needs Maturana's organism-niche ontology and observer discipline. It also needs Kauffman's account of how living systems feel and enact what matters.

Noble gives the causal mesh. Maturana gives the living unity. Kauffman gives felt valuation.

6. Kauffman: Emotional Sentience and the Felt Valuation of Living Agency

Katherine Peil Kauffman enters precisely where a purely physiological or systems-biological account risks becoming too neutral.

Living systems do not merely process signals. They evaluate. They approach and avoid. They seek, withdraw, preserve, develop, remember, and participate. Conditions are not merely external variables; they matter to the living system.

Kauffman's central claim is that emotion should be understood more broadly than conventional psychology usually allows. Emotion includes not only affective feeling, but also coupled action tendencies. Positive and negative feelings are linked to approach and avoidance. Together they form hedonic behavior: movement toward what is experienced as beneficial and away from what is experienced as harmful. Kauffman (2015a) defines emotion broadly to include affective feelings and coupled hedonic motivations, especially approach and avoidance.

This allows emotion to be understood as a biological self-regulatory system. In Kauffman's account, emotional sentience is not merely a late human achievement. It is rooted in the ancient need of living systems to detect, evaluate, and respond to self-relevant changes. Kauffman

(2015b) describes emotion as an ancient self-regulatory sense that guides organisms toward what is beneficial and away from what is harmful. Even at simple levels of life, the organism must enact functional distinctions between conditions that support living and conditions that threaten it.

This gives biological grounding to the language of mattering.

Life does not merely happen. For the organism, life matters.

Kauffman's most generative distinction for this paper is the dual self-regulatory logic of **self-preservation** and **self-development**. Negative feeling is linked to preservation: avoid, protect, withdraw, defend, reduce harm, conserve the body. Positive feeling is linked to development: approach, explore, bond, learn, create, cooperate, and build new capacities.

This should not be treated as a rigid binary. Life is more complex than pleasure and pain. But as a foundational orientation, it is powerful. It allows emotion to be understood not as irrational disturbance, but as felt guidance concerning viability.

Pain says: something threatens conservation.

Pleasure says: something supports development.

Fear says: protect.

Curiosity says: explore.

Trust says: approach.

Shame says: belonging is threatened.

Grief says: a bond or world has been lost.

Anger says: a boundary has been violated.

Love says: this relation may be conserved.

These are not final definitions. They are invitations to inquire into the affective organization of living action.

Kauffman's work also moves into speculative terrain: quantum consciousness, panpsychism, and metaphysical interpretations of sentience. These may be philosophically generative, but the present white paper should not depend on them as its foundation. This bracketing is important because Kauffman (2015a) moves from grounded biological claims about emotional self-regulation into explicitly speculative reflections on quantum consciousness and panpsychism. Kauffman is used in this paper primarily for her biological reframing of emotion as affective valuation and self-regulatory agency. Her wider reflections on quantum consciousness and panpsychism are acknowledged as speculative horizons, not as foundations required for the argument.

The biology of living coordination can respectfully acknowledge that horizon while building its central argument on the grounded biological claim: living systems are affectively valenced agents whose regulation depends on sensing, evaluating, and responding to self-relevant conditions.

Kauffman therefore gives the domain of **affective valuation**.

Maturana shows that emotioning configures relational domains of action. Kauffman shows that feeling and action tendency have deep biological roots in self-regulation. Noble shows how such processes must be realized through multi-level causation.

Together, they allow a crucial reframing:

Emotion is not merely inside the organism. Emotioning is the valenced organization of organism–medium coupling.

Part III — The Biology of Living Coordination

7. Living Constitution

The first domain of the biology of living coordination is **living constitution**.

Its guiding question is:

What must be conserved for this living unity to continue living?

This question is prior to the usual physiological question, “How does the body work?” It asks first what kind of unity is working. A living being is not a machine that continues by preserving its parts unchanged. Nor is it a substance that remains materially identical through time. It is a dynamic unity that persists by conserving organization while its components continually change.

Living constitution therefore cannot be reduced to composition. The organism is not alive because it contains the right inventory of parts. It is alive because those parts participate in a recursive organization of self-production, boundary maintenance, repair, exchange, and relational continuity.

The central distinction is:

Structure changes; organization must be conserved.

This distinction immediately changes how we think about health, disease, development, and healing. Health is not sameness. Development is not loss of identity. Healing is not merely return to an earlier structure. Aging is not merely damage accumulation. Disease is not simply molecular deviation. Each must be understood in relation to whether the organism’s living organization remains conserved, narrowed, burdened, or threatened.

Noble’s Biological Relativity strengthens this point. If living constitution were reducible to DNA or molecules alone, the living unity would be a downstream consequence of lower-level instructions. But living systems require form, boundary conditions, and reciprocal relations across levels. DNA, RNA, proteins, membranes, repair systems, and cellular networks all participate within the living unity, not above it or outside it.

The living being is therefore not the product of a sovereign code. It is self-producing organization realized through multi-level causal coordination.

8. Organism–Medium Coupling

The second domain is **organism–medium coupling**.

Its guiding question is:

In what relational medium does this living unity conserve its living?

A living being does not exist first as an isolated organism and then later interact with an environment. It exists only in a relation of adaptation with the medium that makes its living possible. The organism and its niche arise together as a dynamic ecological organism–niche unity.

This means “environment” is too weak a term if it is imagined as an external container. The medium becomes a niche only in relation to the organism’s living. Light is not the same world for a plant, an owl, a bacterium, and a human being. Glucose is not merely a molecule in abstraction; for a living system it can become nourishment, signal, excess, scarcity, memory, metabolic stress, or developmental condition depending on the organism’s structure and history. A sound is not merely vibration; in one relational field it may be music, in another warning, in another noise, in another language.

The organism does not simply receive the world. It brings forth a world through structure, sensoriality, action, and history of coupling.

This does not make the world imaginary. It makes living relational.

The medium has its own dynamics. The organism has its own organization. But the niche that matters for living is the relational domain in which the organism’s living is conserved or disrupted.

This has major implications for medicine and public health. A patient does not live in “the environment” in general. The patient lives in a niche: air, housing, food, microbes, family, work rhythm, social trust, violence, care, meaning, climate, economy, technology, language, and institutions. These are not external decorations around physiology. They are part of the organism–medium field in which physiology is continuously realized.

9. Multi-Level Causal Realization

The third domain is **multi-level causal realization**.

Its guiding question is:

Through what levels and boundary conditions is living enacted?

This is where physiology becomes indispensable. The organism–medium unity is not a poetic image. It must be realized through membranes, ion channels, proteins, gradients, gene expression, metabolism, immune regulation, endocrine signaling, neural coordination, tissue mechanics, organ function, behavior, social interaction, and ecological exchange.

A living process is not caused by one level. It is realized through the coordination of levels.

In disease, this coordination may narrow, fragment, lock, or fail. A molecular abnormality may disrupt tissue function. A tissue niche may sustain molecular activation. A social threat may alter endocrine, immune, autonomic, and metabolic regulation. An ecological exposure may perturb cellular repair. A diagnosis may change the patient's emotioning and physiology. A medication may alter pathways, but the organism's response depends on its current state, history, and niche.

This is why physiology must be expanded rather than abandoned. The biology of living coordination needs physiology because living must be causally realized. But it needs Maturana because physiology occurs in an organism–niche unity. And it needs Kauffman because causal realization is valenced by what matters to the organism.

10. Affective Valuation and Emotioning

The fourth domain is **affective valuation and emotioning**.

Its guiding question is:

How does the organism feel, evaluate, and enact what matters?

This domain prevents the paper from becoming a merely structural or causal theory of living. Living systems do not merely conserve organization and exchange with a medium. They are concerned systems. Conditions matter to them. Some encounters support living; others threaten it. Some invite approach; others call for avoidance. Some open development; others demand preservation.

Affective valuation tells the organism: this matters.

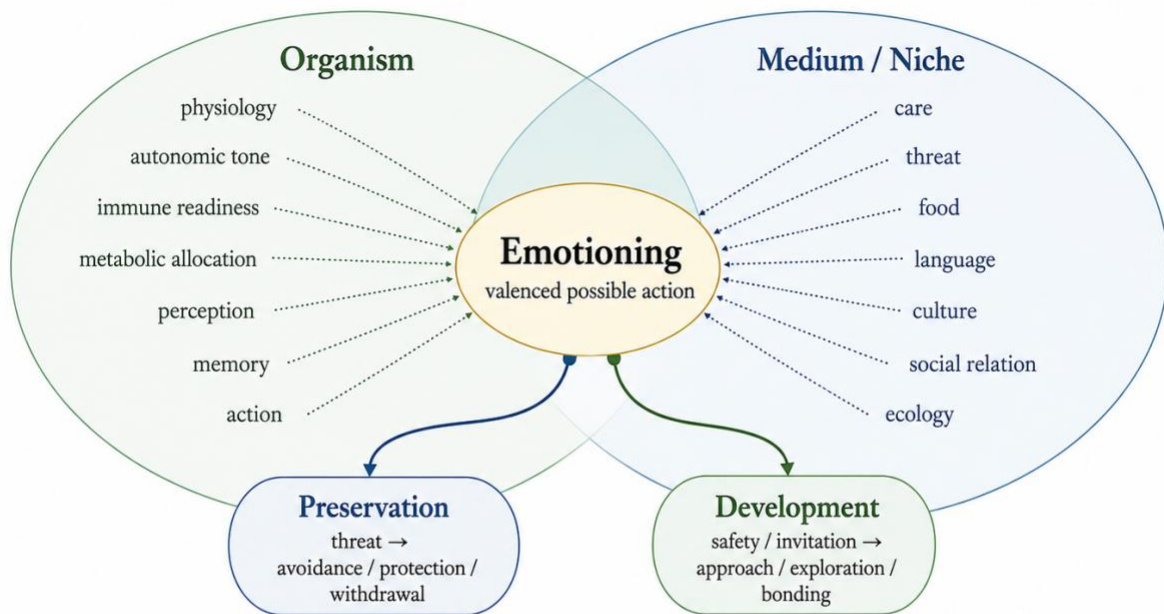
Emotioning configures the relational field in which the organism acts.

Together they form the valenced dimension of organism–medium coupling.

This allows a precise formulation:

Emotioning is the valenced organization of possible action in the organism–medium unity.

Figure 3. Emotioning as Valenced Organism–Medium Coupling



Emotioning is not merely inside the organism; it organizes possible action in the organism–medium unity.

Figure 3. Emotioning as Valenced Organism–Medium Coupling. Emotioning is not treated as a private psychological content added to physiology. It is the relational-affective configuration through which the organism–medium unity becomes valenced: threatening or safe, closing or opening, preserving or developing, avoiding or approaching. Physiological processes, perception, memory, action, language, and niche conditions participate together in determining what worlds of possible action become available.

Emotioning is not treated here as a private psychological content added to physiology. It is the organism’s relational-affective configuration: a whole-organism mode in which perception, action, physiology, language, and world-disclosure are coordinated.

This formulation is broad enough to honor Maturana, biological enough to include Kauffman, and physiological enough to remain compatible with Noble.

It also protects against a common error: psychologizing emotion. Emotioning is not merely “mental.” It includes posture, tone, autonomic state, immune readiness, endocrine pattern, metabolic allocation, perception, memory, language, relation, and action. It is a whole-organism relational configuration.

Fear is not only a feeling. It is a world of threat.

Trust is not only a belief. It is a world in which approach becomes possible.

Love, in Maturana’s sense, is not sentimentality. It is a relational domain in which the other can exist legitimately with oneself. In that domain, certain coordinations become possible that are impossible in domination or negation.

11. Observer Language and Distinction-Making

The fifth domain is **observer language and distinction-making**.

Its guiding question is:

What distinctions are being made, from what emotioning, for what action, and with what consequences?

This is the reflexive domain. It asks not only how organisms live, but how we, as observers, explain living.

Human beings do not merely respond; they language. They generate explanations, theories, diagnoses, cultures, institutions, and justifications. These doings become part of the ecological niche.

This is essential for medicine. A diagnosis is not merely a label. It is a distinction that coordinates action. It can open care or close inquiry. It can bring relief or fear. It can make treatment possible or make the person disappear behind a category. It can legitimate suffering or dismiss it. It can invite agency or impose identity.

The same is true for scientific theories. “Genetic program,” “immune attack,” “brain disorder,” “risk factor,” “noncompliant patient,” “psychosomatic,” “autoimmune,” “resilience,” “normal,” and “pathological” are not neutral words. They guide perception and action.

This does not mean we should abandon diagnostic or scientific distinctions. It means we must become responsible for them.

The biology of living coordination therefore requires a discipline of distinction:

What does this distinction allow us to see?

What does it obscure?

What actions does it invite?

What harms may follow if it is reified?

How does it remain answerable to the living process?

This discipline also applies to the present white paper. “Living coordination” must remain an instrument. “Life-coherence” must remain an evaluative orientation, not an ideology.

“Emotioning” must not become a master explanation. “Biological Relativity” must not be used to avoid mechanism. “Autopoiesis” must not become a slogan. “Emotional sentence” must not be stretched beyond evidence without clear marking of speculation.

These five domains are not separate compartments. Living constitution requires organism–medium coupling; organism–medium coupling must be causally realized across levels; multi-level causal realization is valenced by what matters to the organism; affective valuation and emotioning shape the worlds of possible action; and observer-made distinctions enter those

worlds through language, care, science, policy, and culture. The biology of living coordination therefore does not add one more level to biology. It provides a way of seeing how distinguishable domains of living mutually imply one another without collapsing into one explanatory sovereign.

Part IV — Toward Life-Coherent Inquiry and Action

12. Health as Living Coordination

If the biology of living coordination is the wider domain, health cannot be defined only as the absence of disease, normal laboratory values, physiological efficiency, or subjective well-being.

Health is the organism's capacity to conserve living organization while remaining open to adaptive structural change in relation with its medium.

Health is therefore not stillness. It is coordinated movement.

It is the capacity to shift between protection and openness, effort and rest, vigilance and trust, preservation and development, repair and participation. A healthy organism is not one that never experiences fear, inflammation, pain, fatigue, grief, fever, stress, or withdrawal. These may all be adaptive phases of living. The deeper question is whether the organism can complete the needed transition.

Can defence resolve?

Can repair complete?

Can rest restore?

Can fear release when safety returns?

Can grief reorganize into renewed participation?

Can inflammation return to quiet readiness?

Can the organism re-enter the flow of living?

In this sense, health is not a fixed state but a capacity for coherent transition.

13. Disease as Discoordination

Disease, in this wider frame, is not merely abnormality. It is not simply deviation from statistical norm, molecular defect, organ dysfunction, or diagnostic category. All of these may be valid distinctions, but they do not exhaust the living process.

Disease can be understood more generally as **discoordination in living**: a disturbance, narrowing, overload, misalignment, or lock in the organism's capacity to conserve organization while changing structure in relation with its medium.

This does not mean all disease is the same. It does not erase infection, trauma, cancer, genetic disease, autoimmune disease, vascular disease, degeneration, poisoning, malnutrition, or social violence. It means that whatever the specific mechanism, disease matters because it alters the organism's living coordination.

A molecular mutation can disrupt tissue architecture. A toxin can impair mitochondrial energy. A chronic threat can alter endocrine, autonomic, immune, and affective regulation. A social humiliation can change the physiology of posture, sleep, appetite, vigilance, and self-relation. A diagnosis can either organize care or create fear. A culture can either protect living margins or normalize chronic perturbation.

The disease name may identify the pattern recognized by medicine. The biology of living coordination asks what has become difficult or impossible for the organism to coordinate.

14. Healing as Restored Movement

Healing is often imagined as correction of damage or return to normal. Sometimes this is appropriate. A wound closes. A fracture unites. An infection clears. A deficiency is corrected. A rhythm is restored.

But in living systems, healing is not merely repair of a part. It is the recovery of movement in the living unity.

Healing occurs when the organism can resume coherent transitions that had been interrupted, blocked, narrowed, or overburdened.

This may involve suppression when destructive activity must be stopped. It may involve restoration when structure has been lost. It may involve removal when harmful material persists. It may involve rest when energy is depleted. It may involve meaning when fear or confusion has closed the world. It may involve social repair when the niche has become unsafe. It may involve public health when the conditions of illness are not individual but environmental or civilizational.

Healing is therefore not opposed to biomedical treatment. It includes biomedical treatment but situates it inside the organism–medium field.

A medication is not merely a chemical correction. It is a perturbation introduced into a living system. Its effect depends on the organism's structure, history, state, physiology, emotioning, and niche. The same intervention may heal, harm, suppress, stabilize, or fail depending on the coordination into which it enters.

Healing, in this frame, is not forcing life into a predetermined form. It is helping living movement become possible again.

15. Care as Structural Coupling

Care is often treated as the humanistic accompaniment to technical medicine. In the biology of living coordination, care is more than accompaniment. Care is part of the causal field.

A clinical encounter changes the patient's niche. The words used, the posture of the clinician, the timing of explanation, the recognition of suffering, the clarity of plan, the safety of follow-up, and the quality of listening all become part of the organism–medium relation.

This is not sentimental. It is biological.

For a human being, language is not outside physiology. Human worlds of conversation, explanation, reflection, and theory are part of the ecological niche. A diagnosis delivered without care may increase threat. A diagnosis delivered with clarity may increase orientation. A clinician's dismissal may deepen isolation. A clinician's recognition may restore agency. A treatment plan may become either burden or path.

Care therefore participates in structural coupling. It can alter the patient's emotioning, sense of possibility, trust, attention, adherence, and physiology.

This does not mean care replaces evidence. It means evidence must be enacted in care.

16. Wu-Wei as Non-Forcing Participation

The practical posture that follows from this inquiry is **wu-wei**: not passivity, not inaction, not resignation, but non-forcing participation in the living movement of the system.

Wu-wei action asks what wants to move, what cannot yet move, what is being conserved, what is being protected, and what minimal sufficient perturbation may allow the next coherent transition.

Wu-wei does not mean non-intervention. It means non-forcing: action proportionate to the living situation, guided by the system's constraints, margins, timing, and next possible transition.

In the context of living coordination, wu-wei has four meanings.

First, it means not imposing a framework before the living process has been sufficiently seen.

Second, it means not confusing control with care.

Third, it means not mistaking intensity of intervention for depth of healing.

Fourth, it means acting from a disciplined emotioning of humility, curiosity, precision, and love rather than fear, domination, urgency, or theoretical possession.

Wu-wei is therefore compatible with Maturana's natural drift. Living systems do not move toward an externally imposed ideal. They conserve living along paths generated through their structure, sensoriality, and coupling with the medium. The task is not to force life toward our model, but to participate in the conditions under which living can continue, repair, and develop.

It is also compatible with Noble's Biological Relativity. Because no level is sovereign, intervention should not assume that changing one part automatically restores the whole. One

must ask which level is carrying the constraint, which boundary conditions are missing, and how changes at one level may alter others.

It is compatible with Kauffman's emotional sentence because action must respect the organism's valenced self-regulation. To force a frightened organism may deepen defence. To ignore distress may abandon preservation. To support safety may open development.

The principle is:

Use the minimum sufficient force required to protect living and open the next coherent movement.

17. Public Health and Civilization as Extended Niche

Public health appears differently when seen through the biology of living coordination.

It is not only prevention of disease. It is protection of the conditions under which living systems can conserve organization, develop, repair, participate, and flourish.

Clean air, safe water, nutritious food, stable housing, microbial ecologies, sleep-protective rhythms, violence prevention, social trust, education, climate stability, dignified work, access to care, and truthful public knowledge are not merely social goods added to biology from outside. They are organism-medium boundary conditions.

If the niche repeatedly perturbs living, medicine will be asked to treat the consequences. If housing is unsafe, air is polluted, food systems are metabolically disruptive, social life is chronically threatening, and climate systems destabilize the conditions of life, then bodies will carry the burden.

Public health is therefore the societal practice of protecting living coordination at population scale.

For human beings, civilization itself becomes part of the niche. This does not mean civilization is natural in all its forms, nor that every institution supports living. It means that human living is biological-cultural. Languages, economies, technologies, schools, laws, media systems, health systems, food systems, and political orders become part of the ecological field in which human autopoiesis is conserved or disrupted.

A civilization can therefore become salugenetic or pathogenic.

It becomes salugenetic when its institutions protect living conditions, support trust, conserve ecological integrity, enable meaningful participation, and allow organisms and communities to recover from perturbation.

It becomes pathogenic when it destroys margins, normalizes threat, abstracts value away from life, fragments care, accelerates stress, corrupts language, destabilizes ecosystems, and then blames individuals for failing to remain well inside incoherent conditions.

Life-coherence becomes useful here, but only if held carefully. It should not be treated as a doctrine imposed on life. It should be used as an evaluative question:

Does this relation, practice, intervention, institution, or distinction preserve, restore, or expand the conditions for living coordination?

Life-coherence is not the doctrine by which living coordination is interpreted. It is the evaluative question that arises once living coordination has been described: does this pattern preserve, restore, or expand the conditions under which living can continue?

Life-coherence belongs after the domains of distinction, not before them. It is not the starting frame. It is the evaluative orientation that asks whether our coordinations serve living.

The wider the inquiry becomes, the greater the need for discipline. Once living coordination is extended into health, healing, care, public health, and civilization, the risk of overreach increases. A framework that seeks to remain answerable to life must therefore specify what it does not claim, where its evidence is strong or weak, and how its distinctions may be corrected by the living processes they seek to understand.

Part V — Limits, Safeguards, and the Discipline of Staying Open

18. Why the Framework Must Remain Provisional

The biology of living coordination is offered as a domain of inquiry, not as a closed theory.

A closed theory seeks to settle the matter. A domain of inquiry opens a field of disciplined questioning. It proposes distinctions, tests their usefulness, revises them when they fail, and remains answerable to the living processes it seeks to understand.

This distinction is essential because the framework crosses molecular biology, physiology, organism–medium coupling, emotional sentience, languaging, clinical care, public health, and civilization. The wider a framework becomes, the greater its risk of overreach.

The framework should therefore be treated as:

A disciplined grammar for inquiry, not a final map of life.

“Living coordination” must not become a new possession.

19. What the Framework Does Not Claim

The biology of living coordination does not claim that all existing biology is reductionist. Modern biology contains many relational, developmental, ecological, evolutionary, systems, and organism-centered traditions. The framework does not replace these traditions; it seeks to give them a wider home.

It does not claim that physiology is insufficient because mechanisms are unimportant. Mechanisms are indispensable. Boundary conditions do not replace molecular, cellular, or organ mechanisms; they situate them.

It does not claim that emotion explains everything. Emotioning and affective valuation are central, but they are not sovereign. They participate in living coordination alongside metabolism, development, immune regulation, tissue architecture, ecological conditions, social relations, and observer-made distinctions.

It does not claim that subjective experience can replace evidence. Experience matters because living is lived, felt, and enacted. But experience must be held in dialogue with physiology, clinical observation, careful measurement, and shared inquiry.

It does not claim that disease is always meaningful in a comforting sense. Disease can be brutal, destructive, accidental, infectious, genetic, toxic, traumatic, malignant, or degenerative. The framework asks how disease disrupts living coordination; it does not romanticize suffering.

It does not claim that non-forcing action means weak action. Wu-wei may require urgent surgery, antibiotics, immunosuppression, resuscitation, quarantine, or decisive public health intervention. Non-forcing means acting in alignment with the living situation, not avoiding necessary force.

It does not claim that Kauffman's more speculative metaphysical horizons are established science. Her grounded contribution lies in emotional sentience as self-regulatory affective valuation. Her wider reflections on quantum consciousness and panpsychism may remain philosophically generative, but they should not carry the scientific weight of the present framework.

20. Five Methodological Safeguards

To remain disciplined, the biology of living coordination requires safeguards.

First, keep mechanism and meaning together. Mechanism without meaning risks lifeless reduction. Meaning without mechanism risks vagueness. A living coordination approach should always ask both: what is happening mechanistically, and what is happening for the organism?

Second, distinguish without separating. Organism and medium can be distinguished, but in living they are not separate. Biology and culture can be distinguished, but in human living they are not separate. Physiology and emotioning can be distinguished, but in the organism they are not separate. Observer and distinction can be distinguished, but in explanation they are not separate.

Third, mark evidence strength clearly. Some claims are strongly grounded. Some are interpretive. Some are speculative. This differentiation protects the integrity of the work.

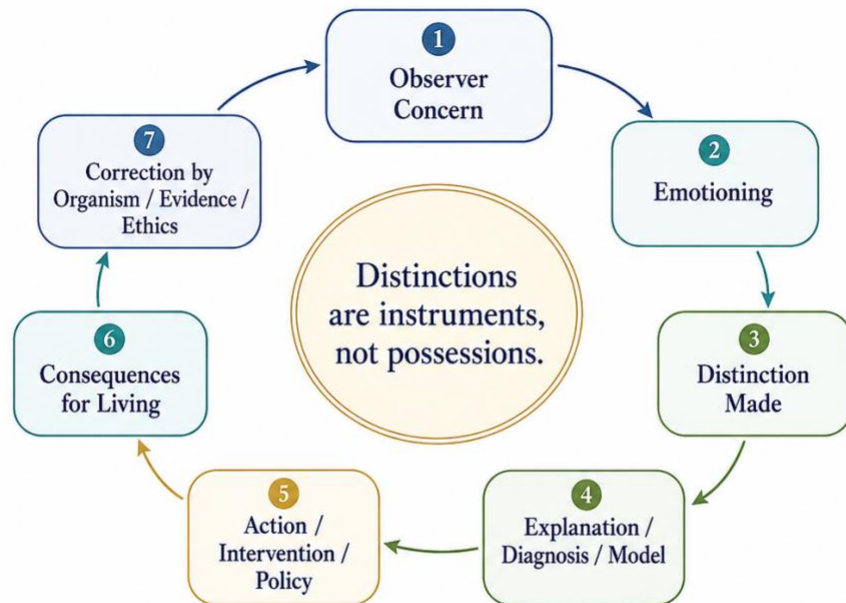
Fourth, keep the observer visible. Every section of this project should ask: who is making this distinction, from what concern, in what emotioning, for what action, and with what consequences?

Fifth, let the organism correct the framework. Clinical outcome, patient experience, biological evidence, ecological consequence, and ethical reflection must all be allowed to correct the theory.

The organism does not belong to the theory.

The theory must remain answerable to the organism.

Figure 4. From Distinction to Action: The Observer's Discipline



Human beings do not merely describe living systems; they make distinctions that coordinate action.

Figure 4. From Distinction to Action: The Observer's Discipline. Human beings do not merely describe living systems; they make distinctions that coordinate action. A distinction arises from an observer's concern and emotioning, becomes explanation, diagnosis, model, intervention, or policy, and then produces consequences for living systems. A life-coherent inquiry must allow those consequences — clinical outcomes, patient experience, biological evidence, ecological effects, and ethical reflection — to correct the distinction.

21. The Risks to Avoid

The first risk is vague holism. Terms such as “whole person,” “living coordination,” “organism–medium unity,” “life-coherence,” and “emotioning” can become beautiful but imprecise. They can create the appearance of depth without improving inquiry or action. To avoid this, every holistic statement should be disciplined by operational questions: What levels are involved? What mechanisms are known? What boundary conditions are relevant? What can be measured? What is uncertain? What action follows? What would count as improvement? What would show that the interpretation is wrong?

The second risk is anti-biomedical misuse. A patient with sepsis needs antimicrobial and supportive care. A patient with diabetic ketoacidosis needs insulin, fluids, electrolytes, monitoring, and skilled clinical management. A patient with lupus nephritis may need immunosuppression. A patient with cancer may need surgery, chemotherapy, radiotherapy, immunotherapy, or palliative care. Life-coherence does not mean replacing these interventions with vague relational language. It means situating them inside the living field so they are used wisely, proportionately, and with attention to the organism's whole condition.

The third risk is psychologizing disease. Emotioning is central, but not because disease is “all in the mind.” Emotioning is central because living is embodied, relational, valenced, and

physiologically enacted. To say that emotioning participates in disease is not to blame the patient. It is to recognize that the organism lives as a whole.

The fourth risk is romanticizing emotion. Emotioning is not automatically wise. Fear can protect, but it can also narrow perception. Anger can defend a boundary, but it can also destroy relation. Shame can signal social danger, but it can also collapse agency. Pleasure can guide development, but it can also become compulsive. The question is not whether an emotion feels pleasant or painful. The question is what living coordination it supports or disrupts.

The fifth risk is civilizational overreach. A civilization can shape health conditions profoundly, but not every illness is a direct civilizational indictment. Disease-specific mechanisms, individual histories, chance events, pathogens, genetic susceptibilities, and local circumstances remain real. The civilizational lens is strongest when asking what conditions repeatedly perturb living systems, what margins are being destroyed, what forms of care are being weakened, and what institutions protect or undermine living coordination.

22. Conclusion: Toward a Science Answerable to Life

This white paper began with a pause. The aim was not to force Maturana, Noble, and Kauffman into a premature synthesis, nor to subordinate them to an existing clinical or immunological framework. The aim was to take a double look and ask what domain of inquiry their distinctions allow to appear.

What appeared was not physiology alone, though physiology remains indispensable.

It was not systems biology alone, though systems thinking is required.

It was not phenomenology alone, though lived experience matters.

It was not emotion theory alone, though emotioning is central.

It was not culture alone, though human beings live biological-cultural lives.

The wider domain is the biology of living coordination.

This domain begins from the living unity, but does not isolate it. It situates the organism in the medium that becomes its niche. It follows living through multi-level causal realization. It recognizes that living is valenced, that organisms feel and enact what matters. It keeps the observer visible, because human beings bring forth worlds through languaging, distinction, explanation, and action.

The central ethical implication is simple but demanding:

Life must not be forced to fit our distinctions; our distinctions must remain answerable to life.

This is the discipline that prevents reductionism, vague holism, theoretical possession, and clinical domination.

The biology of living coordination invites a science that can measure without deadening, explain without possessing, intervene without forcing, and care without abandoning rigor. It invites medicine to become more organismic, public health to become more ecological, education to become more reflexive, and civilization to become more life-serving.

It does not promise final answers.

It offers a field in which better questions can be asked.

And perhaps that is the proper beginning: not a theory that closes life, but a discipline of inquiry through which life may continue to disclose itself.

Back Matter

Appendix A. The Five Domains of Living Coordination

The biology of living coordination is organized around five foundational domains of distinction. These are not separate compartments or levels in a hierarchy. They are distinguishable domains of one living process.

Domain	Guiding Question	Core Distinction	Principal Anchor
Living Constitution	What must be conserved for this living unity to continue living?	Structure changes; organization must be conserved.	Maturana
Organism–Medium Coupling	In what relational medium does this living unity conserve its living?	The organism and niche arise together in the realization of living.	Maturana
Multi-Level Causal Realization	Through what levels and boundary conditions is living enacted?	No biological level has causal sovereignty.	Noble
Affective Valuation and Emotioning	How does the organism feel, evaluate, and enact what matters?	Emotioning is the valenced organization of possible action.	Kauffman + Maturana
Observer Language and Distinction-Making	What distinctions are being made, from what emotioning, for what action, and with what consequences?	Distinctions are instruments, not possessions.	Maturana

These domains mutually imply one another. Living constitution requires organism–medium coupling. Organism–medium coupling must be causally realized across levels. Multi-level causal realization is valenced by what matters to the organism. Affective valuation and emotioning shape worlds of possible action. Observer-made distinctions enter those worlds through language, diagnosis, care, science, policy, and culture.

The purpose of the five-domain model is not to explain life from one sovereign standpoint, but to prevent premature reduction to any single domain.

Appendix B. Methodological Safeguards

The biology of living coordination requires safeguards because the wider the framework becomes, the greater the danger of overreach.

B.1 Keep Mechanism and Meaning Together

A living coordination approach should ask both:

What is happening mechanistically?
What is happening for the organism?

Mechanism without meaning risks lifeless reduction. Meaning without mechanism risks vagueness.

B.2 Distinguish Without Separating

Organism and medium can be distinguished, but in living they are not separate. Biology and culture can be distinguished, but in human living they are not separate. Physiology and emotioning can be distinguished, but in the organism they are not separate. Observer and distinction can be distinguished, but in explanation they are not separate.

The error is not distinction. The error is turning distinction into separation.

B.3 Mark Evidence Strength Clearly

The framework should clearly distinguish among:

Strongly grounded claims — supported by established biological, physiological, clinical, or public health evidence.

Interpretive claims — conceptual syntheses that organize known domains in a new way.

Speculative claims — philosophical or metaphysical extensions that may be generative but should not bear the scientific weight of the argument.

This is especially important for Kauffman's work. Her biological reframing of emotion as affective valuation and self-regulatory agency is used as a central contribution. Her reflections on quantum consciousness and panpsychism are acknowledged as speculative horizons, not as foundations required for the argument.

B.4 Keep the Observer Visible

Every major distinction should be examined through five questions:

1. Who is making this distinction?
2. From what concern?
3. In what emotioning?
4. For what action?
5. With what consequences?

This is not relativism. It is responsibility.

B.5 Let the Organism Correct the Framework

The framework must remain corrigible through clinical outcome, patient experience, biological evidence, ecological consequence, and ethical reflection.

The organism does not belong to the theory.

The theory must remain answerable to the organism.

Appendix C. Comparative Table: Maturana, Noble, and Kauffman

Thinker	Central Contribution	Domain Opened	Key Risk if Misused	Disciplined Use in This Paper
Humberto Maturana	Autopoiesis, structural coupling, organism–niche unity, emotioning, languaging, observer discipline	Living constitution; organism–medium coupling; observer distinction-making	Turning autopoiesis into a vague metaphor for complexity	Use autopoiesis precisely as the conservation of living organization
Denis Noble	Biological Relativity; multi-level causation; boundary conditions; critique of genetic sovereignty	Multi-level causal realization	Reducing Biological Relativity to vague interconnection	Use it as disciplined causal architecture across levels
Katherine Peil Kauffman	Emotional sentience; affective valuation; emotion as self-regulatory agency	Affective valuation and emotioning	Overextending speculative metaphysical claims	Use her grounded biological reframing of emotion while bracketing speculative horizons

Together, these thinkers disclose the wider field of living coordination. Maturana gives the living unity and observer discipline. Noble gives the multi-level causal architecture. Kauffman gives the felt evaluative dimension of living agency.

Appendix D. Working Definitions of Core Terms

Autopoiesis

The self-producing organization of living systems. A living system conserves the organization that continuously produces and maintains the components and relations that make it a living unity.

Affective Valuation

The organism's felt and enacted evaluation of what matters for its living. Affective valuation includes attraction, aversion, approach, avoidance, preservation, development, threat, safety, and possibility.

Biological Relativity

Noble's principle that no biological level has causal sovereignty. Living function is realized through reciprocal causation and boundary conditions across molecular, cellular, tissue, organ, organismic, ecological, and social levels.

Boundary Conditions

The forms, constraints, relations, and contexts within which processes become possible. In biology, boundary conditions are not merely external limits; they are part of how living function is causally realized.

Care

A relational and practical participation in the organism–medium field. Care includes technical intervention, explanation, recognition, listening, follow-up, trust, and the conditions that allow living movement to become possible.

Discoordination

A disturbance, narrowing, overload, misalignment, or lock in the organism's capacity to conserve organization while changing structure in relation with its medium.

Dynamic Ecological Organism–Niche Unity

Maturana's distinction for the living relation in which organism and niche arise together. The organism does not live in a neutral environment; it lives in a dynamic ecological niche that arises with its living.

Emotioning

The relational-affective configuration through which possible actions are opened or closed. Emotioning is not merely private feeling; it is a whole-organism mode in which perception, action, physiology, language, and world-disclosure are coordinated.

Health

The organism's capacity to conserve living organization while remaining open to adaptive structural change in relation with its medium. Health is not stillness, but coherent transition.

Healing

The recovery of movement in the living unity. Healing occurs when the organism can resume coherent transitions that had been interrupted, blocked, narrowed, or overburdened.

Life-Coherence

An evaluative orientation asking whether a relation, practice, institution, intervention, or distinction preserves, restores, or expands the conditions for living coordination.

Living Constitution

The domain concerned with what must be conserved for a living unity to continue living.

Living Coordination

The historical, multi-level, affectively valenced, observer-distinguished process through which an autopoietic organism–medium unity conserves organization, changes structure, realizes function, enacts worlds, evaluates what matters, and coordinates action within the conditions that make living possible.

Multi-Level Causal Realization

The domain concerned with how living is enacted through reciprocal causation across molecular, cellular, tissue, organ, organismic, ecological, and social levels.

Organism–Medium Coupling

The domain concerned with how a living unity conserves its living in relation with the medium that makes its living possible.

Observer Distinction-Making

The process by which observers bring forth domains of inquiry, explanation, diagnosis, theory, and action through language, emotioning, instruments, practices, and communities.

Wu-Wei

Non-forcing participation in living movement. Wu-wei does not mean non-intervention. It means action proportionate to the living situation, guided by the system's constraints, margins, timing, and next possible transition.

Appendix E. Research Questions Opened by the Framework

The biology of living coordination is intended to generate inquiry rather than close it. Possible research questions include:

1. How do molecular, cellular, organ, organismic, affective, social, and ecological factors interact in specific disease trajectories?
 2. Which boundary conditions alter physiological responses to the same biomedical intervention?
 3. How do relational states such as trust, fear, shame, loneliness, belonging, and meaning alter immune, endocrine, autonomic, and metabolic patterns?
 4. How do diagnostic explanations change patient physiology, adherence, agency, and outcomes?
 5. How do housing, air quality, nutrition, sleep, microbial exposure, social safety, and continuity of care shape recovery?
 6. What biological markers indicate that an organism is moving from defence to resolution, repair, or reintegration?
 7. How do scientific metaphors such as “genetic program,” “immune attack,” “brain disorder,” or “risk factor” shape clinical perception and institutional action?
 8. What kinds of public health systems best protect the boundary conditions required for living coordination?
 9. How can medical education train clinicians to distinguish without separating mechanism, meaning, organism, medium, and observer?
 10. How can civilization be evaluated according to whether it preserves, restores, or expands the conditions for living coordination?
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Appendix F. Practical Questions for Clinical and Public Health Use

For Clinical Encounters

What is the diagnosis or differential diagnosis?

What is urgent and must be protected now?

What is the organism trying to conserve?

What transition appears blocked?

What level is carrying the greatest burden?

What niche conditions are sustaining the problem?

What emotioning is present in the patient, family, clinician, and care system?

What distinction would open better action?

What is the minimum sufficient intervention now?

What would show that living coordination is improving?

For Public Health

What conditions repeatedly perturb living systems?

What margins are being destroyed?

What supports recovery, repair, and participation?

What forms of care are being weakened?

What social, ecological, and institutional boundary conditions are missing?

What disease patterns may signal population-scale organism–medium incoherence?

What policies preserve, restore, or expand living coordination?

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Dr. Bichara Sahely is a physician in Internal Medicine and public health thinker from St. Kitts and Nevis. He holds a BSc (Hons) in Biology from Dalhousie University and MBBS and DM degrees in Internal Medicine from the University of the West Indies. His work integrates clinical medicine, public health, systems biology, ecology, peace theory, life-value philosophy, and life-coherent civilizational design.

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Back Cover Synopsis

The Biology of Living Coordination proposes a new domain of inquiry for understanding life without reducing it to genes, mechanisms, physiology, emotion, culture, or observer-made categories alone.

Drawing on Humberto Maturana's autopoiesis and organism–niche unity, Denis Noble's *Biological Relativity*, and Katherine Peil Kauffman's emotional sentience, this white paper asks how living systems conserve organization, change structure, enact worlds, feel what matters, coordinate action, and generate explanations within histories of organism–medium coupling.

The paper develops five foundational domains: living constitution, organism–medium coupling, multi-level causal realization, affective valuation and emotioning, and observer distinction-making. It reframes health as coherent transition, disease as discoordination, healing as restored movement, care as structural coupling, public health as protection of living conditions, and civilization as an extended niche that may become salugenetic or pathogenic.

Its guiding discipline is simple: life must not be forced to fit our distinctions; our distinctions must remain answerable to life.