Triple Definition or Explanation of Consciousness

Xinyan Zhang

Say2xy@gmail.com

Abstract:

The author argues that consciousness may never be defined or explained with entities or their properties, neither with brains, neurons, and biomacromolecules, nor with particles, waves, and fields. Instead, the author proposes a system with matter, energy, and lives as its components, and with all its components defined as changes. Based on the systematic relationships among these three components, a triple definition or explanation of consciousness is reached:

- Ontologically, consciousness is universal, since it is the systematic distinction between matter and energy.
- Epistemologically, consciousness is unique, since it is the energy systematically formalized, qualified, or diversified by the matter.
- Semantically, consciousness is a meaningless language with lives as its only meaning. In other words, only lives are, but consciousness is not, the cause or effect of mental activities.

From this definition or explanation, the author deduces that consciousness is the same as action, but not the same as mental states, especially not the same as the experiences of a unique self in its unique world.

Therefore, the author argues that many theories of consciousness have explained something other than consciousness itself.

Introduction

It seems to me that knowing is a kind of communication, and understanding is either creating or activating a system that defines or explains the communication.

Such a definition or explanation is based on either the relations among different ones or the togetherness of different changes.

Impossibility with one of them might hint at a possibility in another, especially, when everything else is understood as the relations among ones, the understander might only be understood as the togetherness of changes.

At least, understanding consciousness as changes is one of the possibilities for us to define or explain comprehensively what and how consciousness is, why there is consciousness, and especially its meaning.

As my definition or explanation of consciousness, a system is described below with matter, energy, and life as its components, and with all its components defined as changes (Zhang, 2023).

This system is described below not only ontologically but also epistemologically and semantically.

The ontological definition or explanation

It is one of our fundamental assumptions that the cosmos is a closed system,

composed of elements that never change. The random changes of those elements explain the origins of everything we know. And the system's selection of those changes explains their evolutions.

The idea of such a cosmos may be traced back to Parmenides' notion of the One, and such elements to Leucippus or Democritus' notion of ones.

"One" is the oldest belief hiding in almost all our definitions and explanations, and the main problem is that we cannot define or explain our subjectivity with it. It seems that the more we know the objectivity of our world, the less we understand the subjectivity of our minds.

If the understanding of everything as one and ones does not lead to a unified explanation of both the explainer and the explained, why should we not try something else instead?

Let us suppose here that the only thing we may know is change, and suppose that there is one that is not the one, and there are ones that are not the ones, both of which are only the working language for us to define or explain changes.

There are then two kinds of changes defined or explained, either the changes between different ones or the changes of the one itself. The former changes are empirical, and the latter changes are ontological. In other words, an ontological change is the change of selfness or sameness, not the changes between different selfness or sameness.

Heraclitus of ancient Ephesus identified two kinds of ontological changes:

- Unidirectional or irreversible change (symbolized below as C), as he described: "You cannot step twice into the same river."

- Reciprocal or reversible change (symbolized below as O), as he described: "Fire lives the death of earth, and air the death of fire; water lives the death of air, earth that of water."

C is the opening of O changes, and O is the closure of a C change. Quantum fluctuation is, for example, a kind of O change, and parity non-conservation in weak interaction or spontaneous symmetry breaking is then a C change.

Parmenides argues in his poem *On Nature* that the One might be a perfect sphere or a three-dimensional being. The O, however, may be the change in one, two, three, or even more dimensions. It may be one-dimensional at the very beginning of our universe, and becomes later 10-dimensional as described in superstring theory, 11-dimensional as in M-theory, or 26-dimensional as in bosonic string theory.

It seems to me (Zhang, 2022) that life may then be defined or explained as the oneness, unity, or interdependency of O changes and a C change (symbolized as OC). Birth or death is the event that marks the beginning or end of such oneness, unity, or interdependence.

$$Life = OC \qquad \text{(Ax. 1)}$$

OC is the third ontological change. In other words, life is both and neither of the other two changes.

The O of OC explains a life's free creation, and the C its determined transcendence. OC is a better explanation of adaptation or reproduction than teleology or intelligent design (both of them are the same kind of explanation).

Matter may then be defined as the O change that is not the O of OC (symbolized

below as M), and energy as the C change that is not the C of OC (symbolized as E).

For example, the M may be the neural network that composes a brain, and the E may be the nervous impulse that travels through an axon either from a receptor to a neuron or from a neuron to an effector.

Because of the C of OC, all lives are asymmetric or non-conservative changes. The C of OC is not only the open of O changes but also the directionality of the open. Lives may therefore be divided into two categories according to the contrary directions of their C changes. The one with its C toward the E might be called *a spring life*, and the one with its C toward the M *an autumn life* (Zhang, 2022).

A spring life consumes the M and creates the E, and an autumn life does the opposite.

We should be in a cosmos dominated by autumn lives if it originated from an E. The so-called non-living matters, such as protons, neutrons, or atomic nuclei, may all be understood as the remains of some dead autumn lives deeply frozen by the temperature of our environment.

An artificial life, whether hard, soft, or wet, is not a life if it is neither a spring life nor an autumn life, or if it is inherently immortal.

All plants and animals are living systems, but not all living systems are biological. The possibility that biological living systems may arise from inanimate matter does not exclude the possibility that all known physical entities may have been created by lives existing before them.

Beings are never the ontological limitation of the E, the M, and the OC.

As ontological changes, the E, the M, and OC differ from each other only as components of the same system, even though there is no ontological difference between a system and its components.

Being = systematic relations (Ax. 2)

Ax. 2 means that paradox, self-contradiction, incomplete, ambiguity, ineffability, or uncountability is also ontological, just the same as self-consistency. In other words, no system may ever be complete and consistent if without lives are its components.

Ax. 2 redefines Aristotle's concept of *substance* discussed in his *Metaphysics*, "which is not asserted of a subject but of which everything else is asserted."

It also reinterprets Parmenides' idea that "to think and to be is the same thing."

Even though the M, the E, and OC determine together all the possibilities of a living system, the OC alone explains the system's agency or intentional action.

OC is the only ontological explanation of morality, and also the only explanation of free will, with the O as its freedom and the C as the will.

OC is even a unified explanation of time and space, with the C of OC as the irreversible direction of their changes, and with the O as their frequencies or dimensions.

Because of the C of OC, it is exclusively autumn life's mission to create systems or systematic complexities.

Human beings are not only the M and the E but also living systems dominated by autumn lives, which explains why creating systems has been our main business, and why we explain or define everything in systematic relations.

Ontologically, consciousness may only be defined or explained as the systematic distinction between the E and the M.

The epistemological definition or explanation

The E itself is always the same, and so are both lives, even though the E may be different in quantity and the OC may be different in directions. All the distinctions in form are the differences of the M.

The E determines the universality of consciousness and the M its uniqueness.

The M is the structures, the memories, or the complexity of a specific living system dominated by autumn lives, and also the explanation of its intelligence.

In other words, intelligence is always a geometric change.

So are Kant's categories of thought.

Human brains are structurally different not only from non-human brains but also from each other. Even the same brain is not identical to itself across time. Neuroscience may never prove either that consciousness is exclusive to human brains, brains in general, neurons, or organisms, or that consciousness may be explained without an explanation of its general evolution and individual development.

All living systems possess knowledge. Knowledge is nothing more or less than the M or a system's structures. Both perception and cognition are the processes in which the E is manipulated by the M (Zhang, 2023).

Ax. 2 determines that no memory or knowledge is possible without the E, the M, or lives gathered as components of the same system. The directionality of autumn life determines fundamentally the nature of memory or knowledge.

The C of autumn lives also determines memories to be either hereditary or acquired. For example, all the physical, chemical, or biochemical elements in our bodies or brains are our oldest hereditary memories.

Every living system, including its subsystems, may have its own hereditary or acquired memories. Hereditary memory or knowledge determines a system's hereditary behaviors, and acquired memory or knowledge those acquired behaviors.

Different species may always arise based on different complexity of the M.

Evolution is nothing more or less than the changes of the M, which follows the direction of autumn lives. Therefore, knowledge and evolution are one and the same change. In other words, knowledge is not subjective or objective, but only systematic.

No knowledge or evolution is possible if there is no life.

Epistemologically, consciousness may only be defined or explained as the E formalized, qualified, or diversified systematically by the M.

The semantic definition or explanation

Only lives can communicate with each other, and subjects, egos, or selves cannot.

No language as language is possible if there is no life.

The M is the only thing communicated when an autumn life acts as the sender, and the E is the only thing communicated when a spring life does.

Both the E and the M are symmetric or conservative changes, and both lives are dissymmetric or non-conservative changes. An effect may become its cause if in symmetrical or conservative changes, but never in life changes.

A symmetric or conservative change may only be a language since it may not be a cause or an effect. And life changes may only be the semantic meaning since they may not be communicated. Therefore, a language and its meaning may never be one or the same. Their semantic relation may be formulated as:

$$OC = \textit{the meaning of } E \textit{ or } M \qquad \text{(Ax. 3)}$$

Lives are therefore the only cause or effect of all other changes in our brains, bodies, societies, and cosmos.

The E and the M are the fundamental differences between languages. And all that we experience is always a duet of them both.

Understanding is a life change and knowing is the communication of E or M. Semantically, information or the meaning of communication may only be understood but never known.

Consciousness is the systematic distinction between the M and the E. The reason why there is consciousness is that it may be the birth of autumn lives. In other words, consciousness is the knowing that may lead to understanding.

Science and philosophy are the relations between consciousness and life.

A Turing machine can know or behave intelligently and even consciously, but it may never understand if there is no life as the cause or effect of its activities. Artificial intelligence is meaningful only because there are human lives as its cause or effect.

Ax. 3 means that all languages are equal to each other.

It also means that there is causation but no first cause.

Semantically, consciousness is neither the cause nor the effect of mental activities, and it may be defined or explained as a language with lives as its only meaning.

The relation between consciousness and cognition

If cognition may be understood as the experiences of a unique self in its unique world, it may be deduced that consciousness is neither the cause nor the effect of such experiences.

How is it possible that the M and the E divide themselves into a self and its world? And why is this necessary?

How could we explain the experience that a cognitive subject may also be the object of its cognition?

The triple definition or explanation described above means that the self or the world is neither an entity nor properties, and that life is the only cause or effect of such a self in its world.

Consciousness is the interactions between the E and the M. Those interactions are

always polarized and directed by autumn lives, and a self in its world is the result of such polarization and directionality. Consciousness may only be symmetric or conservative changes if there is no life.

LLM (Large Language Model), for example, is enabled, not by the amounts of data but only by their polarization and direction. LLM will not be so wonderful if the data have not been polarized and directed by human lives.

The directionality may be understood as that the M must always be different from itself, and must also change in the direction of autumn lives.

The polarization or the skewness distribution between a self and its world may be understood as the geometric relation between a cone's apex and base. There is no boundary, no interaction, and no causality between any self and its world, just as to say that there is no topological distinction between the apex and the base.

Subjectivity and objectivity are always one and the same story.

A unique self in its unique world is the intelligence of every living system and all its subsystems. In other words, such a geometric relation is the key for us to understand the essence of intelligence.

A unique self in its unique world is nothing for a living system to know, and there is nothing that a living system can do for the self or its world.

Such an intelligence may be found in every living system. Lives always create different selves in different worlds throughout their existence.

Such a unique self in a unique world is the truth of its system, nothing more or less.

No such a world is real or unreal, no such a self is real or unreal, and neither of them is a subjective or objective truth.

Neither the self nor its world is possible if there is no life, or if the E and the M exist alone. Therefore, such an experience is neither phenomenological nor existential.

Not only are beings impossible, birth and death are impossible, even time is impossible if there is no life.

There is nothing good or bad, beautiful or ugly, if there is no life.

There is no desire if there is no life.

No language, linguistic predictability, or philosophy of language is ontologically possible or semantically meaningful if there is no life.

No logic, number, or natural law is ontologically possible and semantically meaningful if there is no life.

No possibility is possible in a world of symmetry and conservation.

OC means that not all but only some possibilities, some possible variation or differentiation, may exist together.

The mirror symmetry between consciousness and action

Neither consciousness nor action is the interaction between a self and its world.

Even though the only difference between them is their opposite direction,

consciousness does not go from a world to a self, nor action from a self to a world.

Many mental events may be understood as the systematic relation of E-M-E (Zhang, 2023, 2022). For example, consciousness may be understood as the change in which the first E in the relation of E-M-E meets the M, and action as the change in which the second E parts the M. And self-consciousness is the second E that parts the M in the E-M-E relation, becomes the first E, and meets the M again. The M is here the same systematic definition for both of the E.

Phenomenal consciousness (Block, 2023) is the first E, and access consciousness is nothing more or less than the feedback of the second E.

Many actions are taken as external ways of the feedback of the second E.

Wittgenstein asked (1953 [2010], §621): “What is left over if I subtract the fact that my arm goes up from the fact that I raise my arm?” However, one of the two “facts” is an action or the second E, another is a consciousness or the first E, and systematically, they are not possibly the same.

The E may only be either an action or a consciousness at the same time.

The distinction between consciousness and state changes

The M in the E-M-E may undergo state changes, which are the fluctuation in the quantity of the E that remains in it. If consciousness may be called qualia or quale changes, the state changes are then quantia or quante changes.

If the M may be understood as the strings of a musical instrument, the quantia are

their tension, and the qualia are their play.

Different emotions might all be such quante changes. Many psychiatric disorders might only be the disorders in quante changes.

The states of the M fluctuate all the time. And there are both global and local quantia, which may turn into each other. Changes in electroencephalogram show mainly global quante changes, and so does the alternation of wakefulness and sleep.

The weight as the parameter within an AI neural network might also be understood as a local quante change.

The neurovascular coupling reported in many studies of consciousness might be the consequence of local quante changes rather than quale changes.

The quantitative alternation of wakefulness and sleep may also be found in many cells, organs, and systems in our bodies. For example, the myocardial refractory period may be understood as the period of cardiac muscle's sleep, even though it lasts only for 250ms. The period between two refractory periods may be understood as those cells' waking state and the action potential as the qualia of their communication. Both the communication and the waking state together may be understood as cardiac cells' consciousness. Though different in their complexity, there is no ontological difference between the consciousness among those cardiac cells and the consciousness among neurons in our brains.

Sleeping and waking states may also be understood as ground and excited states of atoms or molecules. Even the activities of an enzyme are also based on its quante changes.

Our physical or mental efforts to do something are all such quante changes, not only quale changes.

Qualia may become quantia, especially when the E is too low in the M, and vice versa.

The relation between the prefrontal cortex and the rest of the cerebral cortex in a human brain might be understood as the relation between quantia and qualia.

The observation defined by quantum physics might also be understood as the qualia based on the waking state of the M. And the wave function might not collapse if the M as the observer is not in a certain waking state.

Biological communication is always a duet of both the quale changes of the E and the quante changes of the M. So are the iterations when training neural networks.

The voluntary movement of our bodies is, for example, such a duet change, with its quale change controlled by the brain through pyramidal tracts and its quante change through extrapyramidal tracts.

The relation between consciousness and mind

Some organisms do not have a brain or nervous system but may still have a mind:

Mind = the togetherness of OC and E-M-E (Ax. 4)

In other words, the mind is both autumn and spring lives systematized or organized by the E-M-E relation.

A mind is always a unique intelligence, and the M is the central part of its uniqueness.

The uniqueness of human minds lies also in the M, not in the E-M-E relation.

There is no intersubjectivity between two or more living systems, or between a system and its environment. Otherwise, there must be intersubjectivity within a living system or between its subsystems. A more unified and therefore more complete understanding of both cognition and action may be formulated as the relation of M-E-M defined mutually by lives in different systems.

Mind and body are the unities of E-M-E and M-E-M.

Its differences from other definitions or explanations

The system proposed here is ontologically, epistemologically, and semantically different from many other theories of consciousness (Van Gulick (2021).

The fundamental difference is that my definition or explanation is based not on entities and properties but on ontological, epistemological, and semantic changes, which means that consciousness might be more fundamental than the brain, neurons, and biomacromolecules, and more fundamental than all known particles, waves, or fields. And it questions the possibility that consciousness itself may ever be defined or explained by neuroscience or quantum physics. In other words, it questions the possibility that consciousness itself may ever be defined or explained as our unique experiences.

It also defines or explains consciousness as quale change, different from quantia such

as states of wakefulness and emotions.

Life alone is my explanation of agency or intentional action, but consciousness is not (Schlosser, 2019), nor the difference between subjectivity and objectivity.

It is, for example, different from Descartes' dualistic explanation since it means that nothing is ontological except changes of the E, the M, and OC; different from the Leibniz's panpsychism explanation since it means that consciousness is neither the cause nor the effect of mental activities; different from functionalistic explanation since it means that no distinction between consciousness and action if there is no life; different from the Higher-Order theory (Rosenthal, 1986) or Recurrent Processing Theory (Lamme, 2020), since it means that consciousness is an inner event of every living system and all its subsystems (what called "attention" may be understood as the results of the behavior of sensory or motor organs); different from the Global Workspace (Baars, 1988) since it means that information may not be broadcasted; different from the integrated information theory (Tononi, 2004, 2008) and dendritic integration theory (Aru, Suzuki and Larkum, 2020) since it means that systematic complexity, such as different neural connections, explains only the differences but not the essence of consciousness; and also different from Daniel Dennett's multiple drafts model (1991) since it means that the E or the M does not compete for survival.

Emergence (Anderson, 1972) is nowadays the presupposition of many theories of consciousness, which presupposes that all microscopic building blocks, such as those particles found by physicists, are the same, and remain the same. For example, a neutron is the same as another and remains the same as itself. But, how could we exclude the possibility that nothing is the same or remains the same, and that the differences found macroscopically are only amplified microscopic differences?

It also negates any teleological explanation, such as *intelligent design*, *predictive processing* (Hohwy and Seth, 2020), *active inference* (Friston, 2022), or *neurorepresentation* (Pennartz, 2022), since teleology does not explain consciousness itself, since there is always something like a soul hiding in teleological explanation, and since no teleological explanation is fundamentally compatible with the evolution and development of living systems, especially not with their origin and extinction.

The C of OC means that evolution or development is not only numerous random events but also a unique direction.

Conclusion

If the mind may be defined or explained as the togetherness of the E, the M, and OC, the E is then consciousness' universality, the M is its uniqueness, and OC is its only cause or effect.

Epilogue

Consciousness is certainly not the ultimate or fundamental question for neuroscience, psychology, the philosophy of mind, and the studies of artificial intelligence to answer.

To be, or to live, that is the question.

References

Anderson, Philip W. 1972. “More Is Different.” *SCIENCE*, vol177, issue 4047.

Aru, J., Suzuki, M., and Larkum, M.E. 2020. “Cellular Mechanisms of Conscious Processing.” *Trends Cogn. Sci.* 24, 814–825.

Baars, Bernard J. 1988. “*A Cognitive Theory of Consciousness*.” Cambridge University Press. p. 345 https://philpapers.org/rec/BAAACT.

Block, Ned. 2023. “The Border Between Seeing and Thinking.” Oxford University Press.

Dennett, Daniel C. 1991. *“Consciousness Explained.”* Little, Brown & Co.

Friston, Karl. 2022. “Active Inference: The Free Energy Principle in Mind, Brain, and Behavior.” MIT Press. ISBN 9780262045353.

Hohwy, J., and Seth, A. 2020. “Predictive processing as a systematic basis for identifying the neural correlates of consciousness.” *PhiMiSci.* 1, 1.

Lamme, V.A.F. 2020. “Visual Functions Generating Conscious Seeing.” *Frontiers in Psychology* 11:83. https://doi.org/10.3389/fpsyg.2020.00083.

Pennartz, C.M.A. 2022. “What is neurorepresentationalism? From neural activity and predictive processing to multi-level representations and consciousness.” *Behavioural Brain Research* 26:432:113969 https://doi.org/10.1016/j.bbr.2022.113969.

Rosenthal, David. 1986. “Two concepts of consciousness.” *Philosophical Studies*, 49: 329–359.

Tononi, Giulio. 2004. “An information integration theory of consciousness.” *BMC Neurosci* 5: 42. https://doi.org/10.1186/1471-2202-5-42

Tononi, Giulio. 2008. “Consciousness as integrated information: a provisional manifesto.” *Biol Bull* 215: 216–242. https://doi.org/10.2307/25470707.

Van Gulick, R. 2021. “Consciousness.” The Stanford Encyclopedia of Philosophy**,** https://plato.stanford.edu/archives/win2021/entries/consciousness/.

Wittgenstein, Ludwig. 1953 [2010]. “*Philosophical Investigations.”* P. M. S. Hacker and Joachim Schulte (eds.), G.E.M. Anscombe, P.M.S. Hacker and Joachim Schulte (trans.), Chichester, West Sussex: Wiley-Blackwell.

Zhang, Xinyan (2023). Consciousness and its meaning, ontologically. *J. Biocosmology -Neo-Aristotelism*, 13 (Yearly Issue):41-60. https://biocosmology.org/wp-content/uploads/2023/12/Xinyan-ZHANG.pdf.

Zhang, Xinyan (2022). How to create a life or mind as the explanation of our consciousness, intelligence and language. Journal of NeuroPhilosophy, *1*(2). https://doi.org/10.5281/zenodo.7253901.