

Neurophenomenology: An Attempt for Universal Synthesis of Time-Experience

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ABSTRACT:

The neurophenomenological theory of time unites the phenomenological understanding of the structure of temporal experience and its constituent elements with the findings of experimental cognitive neuroscience. On the one hand, this leads to a process of external manifestation of strictly defined neurobiological temporal attributes, and on the other – to a phenomenological description that remains close to our actual temporal experience. Neurophenomenology anthropocentrically orients the categorical isomorphism of temporality. The neurobiological foundation of temporality leads to formal descriptive possibilities for expressing its nonlinear dynamics, which, in turn, articulates the nature of actual temporal experience, analysable with the aid of phenomenological reduction.

KEYWORDS: temporality, Husserl, phenomenology, time-flux, neurophenomenology, present, time-object

I. INTRODUCTION

The aim of this article will be to conceptualise an explicitly naturalised view of the experience of the present moment based on two relatively well-established sources: phenomenological analysis and cognitive neuroscience. We sincerely hope that the role cognitive neurobiology plays in the naturalistic conception of time-constructing will be revealed with the help of phenomenological instrumentarium. Of course, it is wise to avoid the fallacy that we will be able to exhaust the entire range of ideas concerning this matter, but we take comfort in the certainty that the present analysis could open the door to a more detailed future specialised study.

The very experience of temporality points to the fundamental fact that subjective consciousness exists solely and exclusively thanks to the transparency of time as such. The phenomenological tradition in philosophy is the one that assigns a central place to the problem of elucidating temporality in the context of subjectivity. This thesis begins with St. Augustine (6;2021), who posits the paradoxical meaning of the present that contains the past (*distentio animi*), passes through William James’s (3;1983) pragmatic attempt to psychologise the present (*specious present*), and culminates in Husserl’s fundamental “definition” of temporality. All mental forms of activity depend on temporality, but temporality itself is autonomous from them. Unlike his illustrious predecessors, who merely hint at the complexity of the problem associated with time, Husserl makes a substantial contribution to the attempt to formulate the basic structures of subjective time. Drawing on some of Husserl’s emblematic theses on temporality, we will attempt to define the utility of empirical neuroscience for the importance of the anthropological synthesis of temporality. Our strict adherence to Husserl’s texts on time should not be viewed as some kind of scholastic obsession with hermeneutic expression.

They are necessary for the study to the extent that Husserl's idea of the emergence of time in consciousness fits optimally with the thesis of the "phenomenologisation" of empirical neuroscience. The very phenomenon of phenomenology as such consists in the possibility that the study of temporality can begin each time from the position of *tabula rasa*. That is why we should not be surprised by the fact that phenomenological description possesses an incredible capacity for cohesion with other spheres of thought. Relying on this property, we will attempt to define the natural scientific naturalisation of time-experience within the framework of a purely philosophical discipline such as phenomenology. The anthropological merits of this thesis will, we hope, be revealed in the description of the results achieved in the field of cognitive neuroscience, compared to the phenomenological constitution of temporality.

We will now attempt to introduce some additional interpretations of the present problem. The approach to the study of temporality is a special case of the cognitive project called "neurophenomenology" (9;1996), in which present experience and its natural biological basis are linked through the principle of interdependence, defined by their specific descriptive nature. We would not hesitate to place these two correlates within the same discourse, since they operate within the same cognitive language. By attaching particular importance to the idea of the experience of temporality, it must be made perfectly clear that we regard this as the existential litmus test of the entire neurophenomenology project.

II. LEVELS OF TIME

Any self-respecting phenomenological study attempting to explain temporality adheres to the cognitive method of phenomenological reduction, which identifies the distinct descriptive variants of this study. We will not focus here on the question for the significance of phenomenological reduction as a fundamental method for time-constructing, while here we will endeavor to focus on the philosophical context of reduction to the extent that its current application is relevant to neurophenomenology. Phenomenological reduction itself consists in the strictly determined limitation of an already established relation within our consistent experience. The linking of phenomena in consciousness provides the opportunity for a "fresher" perspective on them; it allows for the direct emergence of temporality. The sooner we introduce an authentic philosophical attitude into this study, the clearer it will become that the process of domesticating time, inherited from the modern cultural vision, is inadequate.

Even when considered within the framework of a palliative cognitive reduction, such as that undertaken by St. Augustine and James, time in our experience is something entirely different from the instrumental, temporal, linear conception. To exist at all, time presents itself as a linear sequence claiming comprehensive totality. Its internal completeness is so remarkable that it dominates our existence to an incredible degree. At first glance, this totality can be described as follows: there is always a center, a present moment, filled with intentional content. This center is bound to the horizon of the past, projecting an intentional subsequent moment in time. This horizon is mobile: the very moment that was present is regarded as a present that has just passed. This is the fundamental postulate to which we will refer in structuring temporality. It presents this remarkable result in Husserl's research as the result of phenomenological reduction. Another important meaning-defining aspect of temporality, defined thanks to the reduction, is that subjective consciousness does not contain an idea of time as a constituted mental given. Moreover, temporal consciousness itself constitutes a unique substrate within consciousness where reduction cannot be performed. This substrate is a universal mediator between consciousness and everything else that is external to it. Constitutive phenomenology could be characterised as a consistent and radical development of a potential advantage of consciousness over its own cognitive consequences.

Such comprehensive conclusions regarding the paradox that has arisen in human temporal experience can be found in William James: on the one hand, we have the unity of the present – a whole that we can describe using the primary structures of consciousness; on the other hand, this moment in consciousness is inseparable from its flow.

This analysis of the experience of time leads to the distinction of three levels of temporality, to which we will adhere in our study. The first level pertains to temporal objects and events in the world. Therefore, it is close to the ordinary conceptions of temporality in human experience. Second, we will highlight the conscious acts constituted by phenomenological reduction, which constitute the object-events. These acts in consciousness are identified with the concept of “*inner time*”. Their structural forms are the central problem that preoccupies Husserl. The third level of temporality excludes the exterior-interior distinction in the apprehension of phenomena and is called by Husserl the “*absolute time-constituting flow of consciousness*”. (2:1966, p.73)

Time never appears as fragmented, but rather as a sequence of temporal objects-events that are correlates or the internal intentional focus of time-consciousness. Temporal objects-events convey information to consciousness. In contrast to what might interest a psychologist or neurobiologist, the phenomenologist is interested not so much in the content of the information carried by such an object as in the manner of its appearance. According to Husserl, binaryness is a fundamental intrinsic property of a temporal object, involving duration and unity. Duration is relevant to intentionality. It pertains to objects that are subject to temporal localisation. Unity is explained by the individuality of event-objects, contrasted with the uniqueness of a given event against the background of the others. In this way, the temporal event-object implies a certain temporal duration, a certain completed act. And although this entire act is a continuous process in the sense of an articulated present, this unity should not be understood as completeness, but rather as an unfolding order. We will now attempt to explain the process of the constitution of these event-objects in consciousness, as well as their temporal content and duration.

The awareness of sequence is derived from the structural properties of the acts themselves in consciousness. Here, the phenomenology of inner time-consciousness is missing, where the reduced contents, in their totality, necessarily give completeness and explicitness to the idea of time. The entire phenomenology of inner time-consciousness would have to be rewritten by placing emphasis on the approach to experience that serves to support reduction. The claim put forward by Gestalt psychologists (10;2004) that if consciousness is exercised frequently, it can, with minimal effort, reconstruct certain schemas, when necessary, has shown that this reconstruction itself contains quite complex dynamics capable of triggering it. We will only add that the act of recalling a given event in consciousness is accompanied by information about its distance in time. This distance is an irreducible duration that makes the reconstruction itself perceptible as a sudden shift from one temporal aspect to another, but not as a progressive sequence of linear changes. (11)

III. THE NEURODYNAMICS OF TIME-APPEARANCE

The very neurodynamics of time-appearance is based on cognitive agents situated within consciousness. This process appears to be pre-set (determined) with respect to two fundamental aspects. On the one hand, the active, continuous interconnection of cognitive agents is fundamentally mediated by the body’s sensorimotor activity. On the other hand, the autonomous agency of each agent, whose identity manifests through its emergence, is grounded in endogenous configurations (self-organising patterns) resulting from neural activity. (4:1937)

This pre-determination of the neurodynamic process establishes that sensorimotor connection modulates, but does not determine, the active endogenous activity of consciousness, thereby preventing it from becoming a ceaseless stream of meaningless perceived content. Here we will not expand our working framework to extend it (to the extent that such a limitation is possible) to the theory of knowledge as a whole but will concentrate on the essence of this process to the extent that it will be woven into the description of temporality as a neurocognitive process. The pre-determination in question is inherently limited in its expressiveness by dynamic systems that stand in absolute contradiction to the cognitive tradition, which conceals its natural expressiveness in syntactic information, i.e., in the transformation of a given cognitive model into a process.

The debate pitting immanent natural dynamics against abstract dynamics as the foundation of anthropocognitive science remains highly relevant (8;1985). If we assume that such (apodictic) cognitive predetermination exists, every mental act could be characterised by the joint interaction of several functionally definable and spatially localisable areas in the human brain. From a neurobiological perspective, the key to unraveling subjective temporal processing lies in the complex task of connecting and integrating its various components. The main idea we will attempt to explain here is that the various temporal components must be considered in their simultaneity, which directly corresponds to the duration of the experienced present. In our view, the continuous flow of sensory activity and motor sequences is incorporated within the framework of an endogenous conscious dynamic that gives it meaning. This idea should not be viewed merely as a theoretical abstraction; it is fundamental to the phenomenological interpretation of a vast portion of experimental-scientific anthropological data. These endogenously constituted integrative frameworks describe the perception of time as strictly subjective and nonlinear, insofar as the nature of this subjectivity is more of an integrative horizon than a sequence of ultra-brief autonomous temporal moments.

British neurobiologist Evan Thompson (7;1991) proposes the distinction of three levels of duration within the temporal horizon. The first level must include primary events (phenomena) perceived directly. The second level provides for the perception of time within a broader integrative context. And the third level constructs descriptive meanings. The repetitive structuring of these levels recreates a unified whole that makes sense only in relation to the perceptible temporal objects-events. (12) This structuring raises the question of how a phenomenon extended in time can appear as present and at the same time reach so far into the conscious temporal horizon.

The answer must be sought in the third level of duration within the temporal horizon. Here, the neurobiological contents already established acquire phenomenological status and explanation in their capacity as constituted cognitive operations. In other words, the relevant processes in the human brain associated with active cognitive activity should not be considered solely in a spatial sense; attention must also be paid to their temporal expansion, which should not be limited to the primary perception and integration of the duration of temporal events.

Temporal objects-events appear to us as such solely thanks to the correlative acts of consciousness, which possess specific modes of appearance that constitute the semantic core of the idea of immediate temporality. In phenomenology, these modes are identified with concepts such as “present presentness,” “present pastness,” and “present futurity”. Beyond this non-committal designation, however, phenomenological reduction confers on the present a primary and unique status. One argument in support of this thesis is the predicate “deceptive,” which James attaches to the concept of “present”. In fact, the present is not merely a static temporal location; it also possesses the quality of being experiential; it is

rather a space inhabited by consciousness, not a transit point through which external phenomena pass without a trace. The other argument relates the present to the “fecund” structure of the present moment, in relation to which all other subjective temporal forms acquire content.

The present should not be viewed as a point, but as a possibility for the localisation of temporality. It is not an object, but a field with its own structure, analogous to the center and periphery in the structuring of the visual field.

IV. HUSSERL’S TIME-EXPERIENCE

Husserl himself speaks of the present as the boundary of temporality. In other words, the very mode of the present’s emergence requires a more expansive description, which is hindered by the thesis defining the present as a static point. “The present should not be viewed as a point, but as an expanding objectivity whose modified phenomenality has its ‘now,’ ‘before,’ and ‘after.’” (2;1966, p.201)

Husserl confronts the most serious antinomy related to time – whether it is constantly changing or, in a certain sense, remains the same. The temporal object-event (the identification by consciousness of a particular figure) possesses an internal unity that manifests itself initially in its quality as present now-ness. It then slips away from consciousness only to reappear triumphantly later. The initial recognition in consciousness of the temporal phenomenon in its givenness is submerged into the past, much like the movement of an object shifting from the center to the periphery of one’s field of vision. This act marks the beginning of the emergence of the apparent contradiction between sameness and difference, constancy and transience in the organisation of the perceptual temporal process. To clarify this contradiction, we must examine the constitution of the structuring of temporal consciousness, since it is through this that the temporal foundations of mental acts, uniting in the unified flow of consciousness, become possible. That is why, in this part of the present study, it will be essential for us to reflect on the difference between the mode of appearance of the present as such and that of the just-past present past in its capacity as a conscious act.

Husserl attempts to show that the flow of temporality from the present into the just-past-now is not identical to the psychological phenomenon of the immediate reconstruction or representation of the temporal “passage” in memory. We could point to two models (forms that are legitimate in a phenomenological sense) for the emergence of the present in consciousness: the capacity for memory (a sui generis “recalling” memory); imagination and fantasy. Husserl holds that the mechanism for “evoking” memories in consciousness is created in the present, which means that the present as such is certainly present in the act of recollection. For this reason, we cannot claim that there is an element of the past in recollection, because the act itself takes place in the present.

When consciousness recalls that it has perceived a given phenomenon (as opposed, for example, to its current “embodied” perception in the here-and-now), the past (the sequential past), receding into oblivion, becomes evident in its immediacy. In the present, subjective consciousness perceives what has just happened. In memory, however, it is only able to retain it in the form of a palliative re-presentation. This is why memory and the very act of “recalling” within it appear in consciousness in a qualitatively different way from the present. The latter can best be seen in the instrumental re-enactment of some act of perception. When looking at a given object, we perceive in the present moment the part of it closest to us, but thanks to the mind’s ability to recognise semantically, we grasp the unity of its duration, which leads to its internalisation. In this way, the connection is revealed between the primary impression received from the immediate aspect of the phenomenon during the act of visual perception, and the constitutive unity

(realised by consciousness) that causes the identifiable object-event to appear. The phenomenon itself, as it appears in consciousness, acquires meaning, as illustrated by the example above, solely through the aid of numerous retentions, i.e., by “originally” experiencing the present. “We perceive the past solely in primary recollection; only in it is the constitution of the past possible, that is, not through representation but through presentation. ... The meaning of primary recollection consists in bringing this new and unique moment to primary direct intuition, just as the meaning of present-perception is rooted in the immediate presentation of the present to intuition”. (2;1966, p. 41)

Accordingly, Husserl draws a clear demarcation line between consciousness subject to impressions and that built on the principle of re-presentation as opposed to the former. In the impression, the phenomenon is originally constituted and as such is given in the present. Re-presentation presents the object-event as already given in the impression. The latter sets the present; it is the place where the new appears as such. The impression is always actual, unlike recollection (“recalling” in memory), which, for its part, is always re-presentational.

To better understand the dynamics of the impression, Husserl introduces the terms “retention” and “protention”. Retention is an attribute of a given mental act that holds onto the phases of that very same perceptual act in a way that allows it to be distinguished from the experience of the present without turning it into a re-presentation. The primary instrument for this distinction is retention, which becomes its direct connection to earlier perceptions, transforming perception in its totality into a vehicle (in any given spontaneity) for contents that reveal themselves as temporally defined. As has already become clear, time-duration, once subjected to phenomenological reduction, becomes deceptive, which means that it creates an environment in which mental acts demonstrate their temporality. Retention is a specific intentional act that directs the temporally elusive perceived phenomenon toward its constitution as past. It is not an attempt to retain the present in its actuality, but rather an active representation of an absence arising from the modification and dynamic apprehension of the present. Or, to put it metaphorically: it is more a centrifugal movement of the present than a consequence of its image, modified in its intensity. In a temporal sense, however, retention is a rather strange structure. It is a sui generis actual present past, or as Husserl himself puts it: “... it is a perceptible past, something that sounds like the expression ‘wooden iron’ (holzernes Eisen)” (2;1966, p.415)

And indeed, retention would truly be “wooden iron”, unless we accept that the dynamics of temporal presentness can be formulated precisely in the way we did above.

Now, however, we will turn to another aspect of our analysis that has not been as extensively explored as the intentionality of event-objects and the dynamics of temporal retention – two of the “classic” research discourses in post-Husserlian phenomenology. (1;1970) And since our study dwells at some length on the problem of the particularisation of intentional acts and the need to prove the thesis that the dynamics of retention belong to the sphere of temporal analysis constituted in consciousness as a static presence (13), we will now turn our attention to another issue, one that has been rather neglected in interpretive terms – that of the “absolute time-constituting flow of consciousness”. This third level of temporality, as we defined it at the beginning of this study, is defined by Husserl as follows: “It [the flow, ed.] is absolute subjectivity and possesses the absolute properties of something that can metaphorically be designated as a ‘flow’ (Fluß), as a point of actuality, a primary source-point from which the present ceaselessly springs”. (2;1966, p.368)

The idea of the temporal flow in consciousness leads to two important anthropological consequences, which are not as “classical” in their vitality as, for example, the cognitive ones: the genetic constitution of

the analysis of time, described above as a flow of absolute time; and its (the flow's) connection to the dimensions of instrumental perceptions (stimuli).

This (third) level of temporality presents us with incredible obstacles in attempts to explain it, due to its a priori connection to non-philosophical spheres of world-making. But to overcome these difficulties, we will once again turn to philosophical reflection, which is not always situated in the present, but could always accompany all acts of consciousness. This reflection is temporal, since subjective experience is an immanent phenomenon that endures. Our experiences appear as they flow into the past and gradually vanish into the depths of time. That is why we cannot claim that it is immanent to the flow of experiencing consciousness to constitute the duration of object-events and the very experience of temporality. Rather, it could be distinguished from temporal phenomena insofar as it is external to them, a unifying mechanism, yet at the same time it appears inseparable from them, since, being a stream devoid of object-events, it would not be capable of self-manifestation.

„I can describe the situation as follows: That which is perceived, which manifests itself (selbstgegeben ist) as an individual object, is always given in unity (Einheit) with the absolute absence of multiplicity (nicht gegeben Mannigfaltigkeit)”. (2;1966, p. 284)

True immanent temporality is that of actual experiences in and of themselves. Here, however, we encounter another antinomy of temporality: the coexistence of temporal permanence and changeability. Consciousness is a stage where distinct temporal acts and events and their duration continually appear. To articulate this contradiction, Husserl introduces the concept of “double intentionality”, (2;1966, p.379) since it seems that, when speaking of the retention of a given temporal object-event, one will also have to explain the retention of retention (the reflective awareness of the experience of this phenomenon). These two levels of intentionality work together and are inseparably embodied in the unified stream of consciousness. Subjective consciousness itself could not exist separately from the acts it directs or experiences, even though it clearly defines itself as something distinct from them and contains within itself the unborn unity of their possibility of appearing or not appearing.

The inner flow of consciousness as such, however, must be examined according to a specific paradigm. As we have already mentioned, such a source for investigation could be the reflective act, the transformation of awareness of experience into something temporally definable. This is a spontaneous and particularly compelling argument that serves to constitute the stream as a content-phenomenon. Although it lends itself to description, immediate reflection is a task complicated by the simple fact that providing the description of temporality necessary for consciousness is directly linked to the variability of experience itself in its capacity as an experience.

It is precisely this variability in experience that makes it difficult to define useful cognitive distinctions. Another way of making sense of the flow of time in consciousness lies in the act of recollection, bearing in mind that it must be understood as a process of “pure” representation, in view of its nature rather than its specific content. Subjective consciousness can quite clearly recall its most recent past perception. But this “recall” in memory is only complete when it is filled with an embodied context that causes the past perception to arise again. In other words, although the “recall” directs the object that it itself brings into the present in a certain way, this directed object appears as a subjective phenomenological center, but also as a periphery filled with the context of the embodied experience in consciousness. To properly investigate the genetic constitution of the temporality of inner experience, it is of the utmost necessity to direct our reflective focus, used during the experience of recollection, toward the experiences that reproduce themselves.

To the extent that the idea is feasible that consciousness can admit the existence of such a thing as the revival of the boundaries of memory, to that extent it would be possible to discover some isolated essence, sought in recollection as such, which appears in consciousness without our having to specifically seek it in its capacity as a revived experience in and of itself. To put it figuratively: when recalling a given intentional object, the latter appears surrounded by a multitude of retentions associated with its “original” experience. What sets certain retentional boundaries for recollection is the way in which these retentions themselves were constituted in consciousness.

In our attempt to naturalise retentional acts, we have sought to explain the nature of the ever-present past (Husserl’s “wooden iron”). Further investigation of the process of the emergence of inner temporality will inevitably confront us once again with a newly emerging paradox.

The very process of the elusion (de-presentation) of temporality bears the hallmarks of active or even self-generative content. But does a process that can be a cause of itself even exist? In this case, the paradox takes on the “more classical” form of the so-called regressum in infinitum. We will now attempt to shed a little more light on this problem. Here we will need a renewed intuition to resolve the enigma of the mixing of passivity (invariance) and activity (variability) in double intentionality. “The self-manifestation (Selbsterscheinung) of the flow does not require the emergence of a second flow, but rather constitutes itself as a phenomenon in itself (in ‘sich’ selbst)”. (2;1966, p. 381)

The self-manifestation of the temporal flow in consciousness is considered within the framework of our analysis as self-movement, as a general instability that is not so much the subject of an artifactual description, but rather an invariant formal description of the self-organisation of consciousness. That is why relating this self-manifestation to temporality is entirely appropriate. The flow of consciousness in a neurodynamic sense can be viewed precisely in the sense of Husserl’s “wooden iron,” existing in the form of a flow only to the extent that it is constituted in individual trajectories. These are short-lived, active, self-orienting trajectories passing through various levels and phases in the human brain and corresponding to precisely defined intentional objects-events. The idea of isolating some particular level of genetic constitution where experience would be determined from the perspective of absolute time and only then manifesting itself in conscious intentionality seems illusory. Such a type of genetic constitution would undoubtedly be of particular research interest from an anthropological perspective. Such a constitution would introduce variability into the conception of experience constructed in human consciousness.

V. PROTENTION – THE EMOTIONAL TIME

Returning, however, to our original task, stated at the beginning of our study, we will attempt once again to construct the nature of the very passage of time as it appears in consciousness.

One of the essential components characterising experience as such is the suddenness of the shift in the flow of time, accompanied by more or less distinct emotional changes during abrupt shifts in the course of perception itself. In this way, the mechanism by which the present flows into the past (the so-called “retentional trajectory”) appears in consciousness in the form of a present past, sometimes distinctly different from representational memory. This mechanism allows us to assert that emotion is an essential ingredient of every phenomenon. In attempting to clarify the role of emotionality in the actuality of the stream of consciousness, we will turn to the other fundamental term, according to Husserl, characterising the anticipation of temporality – protention. Husserl implicitly presupposes temporal protention by positioning it reciprocally, yet also symmetrically, to retention, considered in its capacity as an invariant temporal structure signifying the past as the opposite of the future. Protention directs the present toward

some possibility of impression, which helps describe it as a kind of pre-figuration of temporality. Husserl speaks of it as an “empty constitution”, having nothing to do with expectation or supposition, defined in the sense of a content-bearing representation of a given idea, by means of which the next present would arise in temporality. To be convinced of this, we need to do nothing more than refer to the same arguments explaining the essence of retention and “evocative” memory. Protention as such possesses the property of “openness,” which in a certain sense aids its analysis. There are, however, at least two reasons to believe that protention is genetically asymmetrical with respect to retention. One is linked to the unchanging fact that everything new is always burdened with a certain emotionality that accompanies the flow of time in consciousness. In fact, protention is not some kind of expectation that can be perceived as “predictable,” but rather an openness possible in its actuality, a non-determinism that is yet to manifest itself. In this capacity, it establishes a natural connection with emotionality or, in other words, with a more appropriate form of conscious self-perception. The other reason to perceive the asymmetry in the “retention-protention” relation is rooted in the very continuous content of retention, which differs greatly from the “fixed” character (consciousness cannot anticipate something fully determined) of perceptuality in protention. The very contents of retention determine the status of protention, which means that the latter cannot modify them in a retroactive sense.

VI. CONCLUSION

To connect all intentional temporal acts, however, and to reflect the tradition initiated by Husserl in the conceptualisation of temporality, it will need a further attempt to propose a new structure of temporality, incorporating the four-dimensionality of the present.

This act should not be viewed as an exaggeration, but rather as a certain dissatisfaction with the a priori linearly defined idea of temporality. Therefore, we will attempt to show elsewhere that time does not consist of continuous lines in the metaphysical sense of the word, but of dynamic flows in consciousness, which articulates the anthropological merits of this theory. We hope that this final attempt at a natural-phenomenological description of time will restore temporality to its inherent primacy in the activity of subjective consciousness.

The three ordinary phenomenological conceptions of the present discussed so far make sense only through their unification into a fourth-dynamic cohesion, which subordinates each of these three elements of temporality within the existence of an active schema that gives meaning to the totality of the process of time-experience. The genetic connection between the temporal components fundamentally determines their internal interdependence.

In other words, this new fourth dimension of the present is not merely a graphical combination of linear contents described in psychological and neurobiological terms, but an effectively constitutive link that is, by its very nature, not merely descriptive but also explicit. This is why the phenomenological emphasis we have sought to incorporate into the “neurobiology-phenomenology” relationship should be placed on the interdependence of the two intentionalities: on the one hand, the inseparability of the static and genetic analysis of temporality, and on the other – the mutual anthropological determination of the instinctive and cognitive constitution of the “I”. Temporal trajectories and the modes of their manifestation are synonymous with unity within such a complex, philosophical, nonlinear conception of time. For this reason, the naturalisation of time, considered in the context of neurophenomenology, assigns to these interdependencies the role of the most immediate spontaneity in the constitution of temporality.

The neurophenomenological theory of time unites the phenomenological understanding of the structure of temporal experience and its constituent elements with the findings of experimental cognitive neuroscience. On the one hand, this leads to a process of external manifestation of strictly defined neurobiological temporal attributes, and on the other – to a phenomenological description that remains close to our actual temporal experience. Neurophenomenology anthropocentrically orients the categorical isomorphism of temporality. The neurobiological foundation of temporality leads to formal descriptive possibilities for expressing its nonlinear dynamics, which, in turn, articulates the nature of actual temporal experience, analysable with the aid of phenomenological reduction. What we achieve in the discourse of neurophenomenological research on temporality is not merely a juxtaposition of individual perceptual contents in consciousness, but an active linking of temporal constituents, in which the effect of the subordination and modification of temporal contents takes on the contours of a complete totality.

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11. *To support this thesis, we could offer an emblematic example. Imagine that we open a door and, crossing the threshold, rush toward someone standing right in front of us. Thanks to the movement of their body and the visual orientation of our consciousness, the face of the person in front of us suddenly becomes familiar: we recognise a friend and extend our hand in greeting.*
12. *Visual perception and the mental image help to clarify the objects-events that are dominated in a passive sense. An event such as this, defined with the help of numerous agents conveying information to consciousness, does not require the active engagement of consciousness. This property of consciousness is of particular importance in cases where individual sensorimotor function is impaired or absent. Phenomenological research itself constantly emphasises the fact that it is in active interdependence with the impressions on which it is based. This active aspect of perception confers a kind of autonomy on temporality in and of itself. It is precisely within this cognitive framework that we will focus our efforts to describe the structural foundation and consequences of this sensorimotor integration in the understanding of temporality. (See [5] above)*
13. The first level can be observed in the connecting interval between the various sensory systems, i.e., the minimum time interval required for two stimuli to be perceived as non-simultaneous, or the

threshold that varies with each sensory modality. Primary events are perceived through the intracellular fluctuations of nerve impulses. This “perception” lasts in the range of 10 to 100 msec. It triggers the emergence of a microcognitive temporal phenomenon, which forms in the mind the idea of a perceived temporal act of a subjective nature.

14. By “static” here we mean adhering to the classical interpretations of Husserl’s analysis of temporality, as developed by his commentators. This type of analysis can be called “static” because it is intentionally directed toward event-objects and toward what appears in consciousness (as an external process or immanent duration). In other words, remaining at the levels of temporality that are more amenable to analysis – such as the appearance of temporal event-objects and the acts of consciousness that constitute them – leads to a certain static quality in the analysis of temporality in its totality.