

Research Article

Significance and its role in the historical constitution and transformation of social reality. A conceptual approach from enactive cognition

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Framed in the relevance and scope of the enactivism approach about cognition for social sciences, this theoretical essay intends to develop an hypothesis about the co-determination role of significance in social action and interaction based on the enactivism approach of cognition processes. We are interested in arguing the central role of subjective and intersubjective significance in the historical constitution of social reality, understanding this constitution as a constant dynamic of meaning production in actions. From this perspective we point out to understand significance as part of the individual and social life experience of the cognitive agent's perceptual, cognitive operation; and besides as a mediation instance between subject and world where naturally lives transformation possibilities. Based on the understanding that social reality is a process that we can define as an unfinished and constant social configuration and reconfiguration, we proposed cognitive production significance as a fundamental factor in the historical constitution and social transformation of the reality regarding this significance can be defined as the imprevisible and chanced convergence of cognitive circumstances in action.

1. Introduction

Within the realm of the social sciences, albeit on the fringes, signification has predominantly been explored from a cultural standpoint. This is due to the dominance of constructionist approaches to society in the study of the social sphere, even those relating to the body, its sensitivities, and emotions². From this perspective, culture is upheld as the primary and sole source of meaning for the

human being, thereby disregarding other meanings that emerge in the everyday course of our lives, not necessarily tied to culture itself, in other words, those stemming from our biological and psychological lineage, which can be designated as subjective or subjectivized.

Nevertheless, there exists an epistemic, conceptual, and methodological challenge associated with these subjective meanings in social analysis. However, as we posit here, the enactive cognition paradigm (also known as the 4E paradigm) seems to offer relevant insights that approach a response to these challenges by conceptualizing cognition as the realm of production of subjective meanings that emerge from action.

Understanding perception as action, the enactivist thesis (Noe, 2004) posits subjective meanings as constitutive elements of behavior, whether they are situational and spontaneous behaviors or habitual and repetitive behaviors that shape conduct, attitudes, and practices.

By integrating cognition and action into a single process, the 4E cognitive paradigm highlights the subjective nature of enacted meanings and suggests that the cognitive-meaning relationship is an interdependent duo that takes place within action. However, for enactivists, the cognition-action relationship, although always subjective, can also occur in participation. It is to be expected that the cognitions or enacted meanings that arise from these types of action provide insights into the role of human behaviors and, naturally, the cognitions that constitute them in the historical-social configuration of actions from which society is established through interaction.

In a general and speculative manner, but with the aim of understanding how cognition is implicated in the historical constitution of social reality, this text seeks to develop a theoretical and conceptual reflection to contribute to an explanation of the role of action/interaction by social agents in the constitutive dynamics of said reality. This understanding is achieved through the examination of the role it plays in the processes of signification embedded in lived cognition.

As we aim to explain, this perspective is relevant for gaining insight into how processes of social stabilization and/or transformation occur. The theoretical argument presented in this text is grounded in the epistemic-conceptual framework concerning the role of meaning and its significations in shaping the social landscape, a framework that can be found in the socio-anthropological legacy of Norbert Elias, Georg Simmel, and Max Weber, as well as in the historical-phenomenological philosophical imprint of Michel de Certeau, Zygmunt Bauman, Maurice Merleau-Ponty, Hanna Arendt, and Ernest Bloch.

From this standpoint, enactive theses regarding the interdependent relationship between cognition, meaning, and action shed light on how subjective and intersubjective significations contribute to the historical constitution of the social not only in terms of memory but, more specifically, in terms of present experience.

With this in mind, this text posits that the role of social agents in the historical configuration of the social is intertwined with their everyday activities, based on the creation of instances of individual and collective action/signification. These instances are in constant tension between what exists and what is possible, precisely due to the tension of meaning that occurs between memory and experience.

Hence, by proposing a cognitive explanation for the role of the mind-body unity in individual and collective action, the enactive cognition paradigm complements the epistemic argument of methodological individualism in the social sciences. In broad strokes, this paradigm suggests that the actions of individuals give rise to, establish, and transform social structures. Therefore, we believe that the analytical reductionism of methodological individualism finds in the theses on enactive cognition a clear foundation for the micro, subjective, and individualistic perspective it advocates³.

Furthermore, by understanding cognition as an element of action, vital movement, or behavior in living beings, enactivism draws attention to the erroneous nature of representationalism, which characterizes classical cognitivism. This representationalism, in turn, forms the core of constructivist explanations upon which dominant sociological approaches to language, culture, emotions, and society rest, even from an anthropocentric perspective.

Based on the concept of "enaction" derived from the English term "enact," meaning action/acting, the enactive cognition paradigm challenges the widespread notion that knowledge involves capturing and processing external information. It rejects the idea that cognition is solely a higher mental operation occurring exclusively in a rational and cerebral manner. Instead, it proposes a novel way of understanding cognition as a sensory-motor, bodily action⁴.

For enactivists, knowing is a mechanism for seeking meaning in which perception is inherently linked to the sensorimotor aspects of the body. Therefore, it introduces a phenomenological approach to cognition, from which theoretical explanations about its role in individual and social action can be derived. These explanations are naturalistic in nature and, as previously mentioned, suggest an argument in favor of methodological individualism. Consequently, they align with anthropological

and phenomenological perspectives, which make sense when discussing the emergence and role of non-symbolic or non-cultural meanings in the dynamic historical constitution of social action.

Since such action constitutes the arena for the articulation of subjective and intersubjective cognitions through the unequal, diverse, and heterogeneous interaction among social agents, social action can continuously give rise to, configure, and reconfigure the social sphere with potentially unpredictable stabilizing and/or transformative outcomes.

From this perspective, it is essential to understand the enactive definition of cognition as action because, in its terms, all cognition is a natural mechanism of living linked to perceptual action. In other words, it's the action from which a meaningful world emerges for the actor who acts, who "moves" in the world as a natural part of their existence. Therefore, enactivists posit that the known world is a world imbued with meaning based on the body that perceives and the situation in which this perceiving body is situated. Thus, the experiential nature of the cognitive mechanism also makes cognition synonymous with signification.

This understanding leads to the concept that cognition and signification form an operational duo that explains individual and social action from the perspective of cognitive behavior. In other words, it explains them as scenarios of perception/action that spontaneously seek and produce meaning simultaneously.

Despite its theoretical heterogeneity, the 4E cognitive paradigm has been established as a theoretical, conceptual, and methodological framework that has been focusing on the study of the mind in experience for approximately 40 years. It centers around the triad of body-environment-interaction. It is a young paradigm still in the process of formalization due to the multitude and diversity of approaches and topics it addresses in its scientific inquiries.

However, the paradigm's youth and proliferation have not hindered the recognition of enactivism's relevance in explaining the social sphere. A brief current exploration of the topics addressed by leading research in the field of enactive cognition clearly reveals not only the impact of the enactive paradigm on the study of social phenomena but also the heuristic possibilities it offers. Subjects such as the relationship between intersubjectivity and social interaction, affectivity and cognition, ethics, cognition, and practical rationality, consciousness and language, social interaction, consciousness, and experience, among others, demonstrate the spectrum of options from which attempts are made to connect the biological, the social, and the cultural. This is done in an effort to provide a holistic, naturalistic, yet non-reductionist view of how life and human social life are organized. Notably, these

contributions have made an impact in areas such as pedagogy, sports, and the arts (Di Paolo, 2016), but it is clear that enactivism also has valuable insights to offer in fields of study like politics, society, marketing, law, and economics.

We believe that the resistance to subjectivity that largely prevails in academic circles studying the social sphere, as well as the opacity and relatively low interest that Luhmannian sociology generated within the social sciences – one of the most evident impacts of classical enactivism in the mid-20th century – have been two determining factors in the disconnection that has resulted in the abandonment of substantial inter and transdisciplinary efforts necessary to contribute to holistic understandings of the social as a historical configuration of human action.

In this text, we aim to reflect on this matter and attempt to construct an explanation regarding the role of signification – which we've seen is postulated to be closely linked to action and cognition – from a non-constructivist perspective. To do so, we must engage in a conceptual reflection on the cognitive-signification duo as proposed by enactivism. This duo constitutes a central aspect for the emergence of subjectivity, intersubjectivity, and social action/interaction. It is from this perspective that we present signification as an unavoidable theoretical and conceptual framework for explaining its role in the historical constitution of social reality.

To navigate our argument effectively, we first establish an explanation of the intrinsic dynamism of the cognitive-signification duo, which contributes to understanding their emergence in action as crystallized possibilities of enacted meaning. Then, we explain how the cognitive-signification duo participates in the historical constitution of social reality due to the uncertain and phenomenological nature of the interplay between virtual possibilities and crystallized possibilities of meaning within the context of individual and collective action by social agents.

Keeping these considerations in mind, the text is organized into three parts. In the first part, through a reflective exposition on the main tenets of the 4E cognitive paradigm, we anchor the concept of enaction as the operational axis of the cognition-action-signification unity. In the second part, we reflect on enaction as a mechanism of social or collective action-cognition-signification. Lastly, in the third part, based on the social implications of this mechanism, we derive a hypothesis about the role of signification in the historical constitution of the social, emphasizing that this constitution depends on the crystallization of certain (and not all) possibilities of action-cognition-signification by social agents within a specific space-time.

2. Significance as an explainer concept of cognitive dialectic of enaction

Although in its early days, the enactive approach, under the guidance of its founder Francisco Varela, acknowledged the existence of another type of cognition that he referred to as symbolic cognition, as it was not embodied and somehow linked to cultural learning. Nowadays, the scattered yet rich body of research that allows us to refer to the enactive approach as a paradigm in cognitive sciences tends to dismiss the idea of the existence of symbolic cognition as such.

In essence, this aligns the 4E cognitive paradigm with the theoretical framework known today as Embodied Cognitive Sciences (ECS). Through the enactive approach, ECS broadens the conceptual and theoretical reference framework for understanding social phenomena as phenomena that can be explained cognitively.

While efforts were made in the social sciences to adopt the cognitive legacy based on the concept of autopoiesis developed by Maturana and Varela in the field of biology of cognition during the 1970s and 1980s, subsequent attempts to refine the theoretical and conceptual apparatus of autopoietic theory in the 1990s, as well as the updating of the enactive legacy within what is now known as the New Cognitive Science, have failed to rekindle the initial enthusiasm.

In our view, however, it is in these recent developments that we can find the most relevant intersections between the postulates of enactive cognition and the social sciences. Without sacrificing its essence, recent developments in the enactive approach correct some of the most controversial and criticized premises of autopoietic theory and its application to complex systems such as human organisms and social systems⁵.

This conceptual shift positions the enactive approach as particularly insightful for considering the role of signification in the historical constitution of social reality from a naturalistic standpoint of social action. By incorporating notions of agency and adaptivity, the New Cognitive Science postulates cognition as intentional and interested, and thus assumes self-reference as a foundational attribute of the signification derived from such cognition.

Consequently, self-reference as an inescapable criterion of enactive cognition not only expresses the intrinsic circularity that any phenomenological approach to subjectivity must adopt for its explanatory pretensions about action and social interaction from a cognitive perspective but also

reveals how it constructs a sense of action. This invites us to think of processes of social stabilization and/or transformation as processes in which the cognitive activity of the subject plays a fundamental role.

As previously mentioned, this makes the 4E paradigm an alternative to the dead-end in which the dilemma between objectivism and subjectivism has become a false dichotomy within the social sciences. This dilemma takes the form of an unproductive confrontation between methodological holism and individualism, but its implications extend to the realm of contemporary scientific knowledge production.

By postulating the enactive nature of cognition, the 4E paradigm has called into question the role of representations in cognitive processes, whether they are representations of an objective world independent of the knowing subject (as in realist and objectivist views) or internal representations projected into that world (as posited by idealist and subjectivist views). With this in mind, it's possible to assert that the 4E paradigm nullifies the problem of the internal/external duality by demonstrating the non-existent separation between the body, the mind, and the environment when it comes to cognition and interaction.

Thus, while contributing to a definition of cognition as lived or embodied cognition that challenges representationalist/constructivist cognitive sciences, it also fractures the understanding of cognition as information processing that occurs in a mind separate from the body. This, in turn, impacts conceptions of the social sphere, where action appears as something separate and specifically indebted to cognition. Through these corrections, enactivism enables a conception of the subject as a cognitive agent from which not only the inescapable presence of cognition in action is posited but also action as a way of inhabiting a world of meaning for the acting subject⁶.

Although in the enactive legacy, the definition of signification is operationally intertwined with the definition of cognition through the notion of sense-making, as we will see later on, it is important to separate them to precisely establish the role that signification plays in enacted cognition as an instance of perceptual orientation. This allows us to position the role of signification in the emergence of that enacted world, known as lived, where the subject "moves," acts, and behaves.

This is what we will attempt to explore further, beginning with a description of the characteristics of what is known by its acronym in English as 4E cognition⁷. This characterization will allow us to infer the role of signification in cognition from the enactive legacy, and, in turn, will enable us to develop

the operational difference between cognition and signification, which is essential for understanding how this duo participates in the historical constitution of social reality.

First E. Cognition emerges from the action that a living organism carries out with its body – with its potentialities and limitations – in a specific environment. Essentially, it is an action that perceptually establishes the existence of a world perceived from the body. Due to the co-determination between action and perception, cognition is embodied, and signification is associated with the sensoriality of the agent's body that knows, limited to how the body senses or feels.

Second E. Since there is no body outside the space-time coordinates of experience, cognition not only emerges from the interactions of the body with the environment but from a specific body and a specific environment in which the body moves, acts, and experiences the world in a determined space-time. In this sense, both the body and the mind, and the environment in which the organism lives, are crucial in cognitive emergence, which explains this second characterization as embedded, nested, or situated. From this perspective, both cognition and signification are seriously involved in the processes of interaction, thus emphasizing their relational and situational nature. Signification, therefore, emerges closely tied to experience.

Third E. From the characterization of cognition as extended, it is assumed that cognitive processes are not only inside the brain but can extend outside through the body. This means that when the body changes over time, cognition also changes regarding the relationship of that body with the environment. It is assumed that the cognitive system is coupled to the environment, where neural cognitive processes serve as the basis for more complex cognitive processes, enhancing and complementing basic cognitive capabilities through the interaction of body-mind-environment. From this perspective, signification is understood as a dynamic process of change resulting from multiple and different cognitive connections facilitated by experience.

Fourth E. Cognition is characterized as enacted, which implies not only emergence but also action. It is what emerges from the action that is imbued with meaning in this emergence. Therefore, cognition is understood as an action, an activity with purpose, assuming the subject as an agent who acts or moves within the environment, guided by their own cognitive process. Consequently, signification is understood here in its pragmatic nature, as an action with purpose, i.e., oriented, as conceptualized by Galarsi et al. (2011) to behavior.

As you can see, the 4Es of cognition define it as a perceptual operation that allows the cognitive agent to configure a self-referential world in terms of meaning, even if it involves shared significations (Di

Paolo, 2009). In this context, self-referentiality presupposes cognition and signification as mental operations that start and end with individual cognitive agents as perceptual agents. Both, in their conjunction, are defined as an indispensable mediation platform, vitally necessary and ontologically irreducible beyond the phenomenological configuration from which it occurs as a practical experience of living. In this sense, cognition and signification become operations that shape the very sense of living, as two sides of the same coin (Di Paolo, 2015).

Logically deducing from the above, judging by the characterization of the 4Es of cognition that we have described, cognition and signification are interdependent operations because one cannot exist without the other. Thus, while the essence of cognition is perceptual, sensorimotor action, from which the perceived world or environment arises, the essence of signification is self-referential meaning production, inscribed in that perceptual action.

Viewed in this way, the cognition-signification duo can only manifest itself through the combination of four factors: 1) the sensoriality of the perceiving body, 2) the situationality of the experience of action/interaction in which this body is involved, 3) the intentionality of the action/interaction/cognition being executed, and 4) the accumulated history of previous significations (Varela, Thompson, and Rosch, 1997).

These four factors allow meaning to be involved in cognition through the production of differences. This understanding helps us comprehend that based on the perceptual nature of the cognitive agent and the type of experiential action in which this agent is cognitively embedded, meaning is implicitly intertwined with the diversity of meanings that the agent generates throughout their life. In this view, meaning is crucial for identifying and recognizing the relevance that the world holds for an agent at a specific moment or experience.

Taking this into account, meaning constitutes a cognitive operation that functions as a feedback and natural updating mechanism for cognition, and it is intrinsically linked to any cognitive operation. Therefore, not only does cognition inherently involve meaning from the outset, which is to say it is perceptual, but, and this is significant for the social sciences, all meaning is cognitively constructed through the interaction of the body as an individual sensorimotor apparatus within the environment in which it lives and experiences life.

From this, two conclusions can be inferred. First, lived cognition is inherently subjective because it constitutes, alongside meaning, a perceptual mediation of the subject concerning the environment, occurring through the sensory motor nature derived from the body in motion. Second, it is precisely

because of this that meaning emerges as the explanatory factor behind the variation in cognitive values. In essence, it allows us to affirm its role in the continuous configuration and reconfiguration of the subject's repertoire of meaning, their identity, and their possibilities for action.

As Di Paolo (2015) aptly notes, living systems, which are biologically closed systems by excellence, reconfigure their identity when impacted by external disturbances and changes. This leads to the incorporation and integration of new values, thereby transforming cognition itself, which is embedded in every interaction between the organism and its environment. In this sense, the expansion, increase, and even refinement that cognition achieves through meaning not only helps us understand the role of meaning in survival (Weber and Varela, 2000) but also in practical domains of action that don't involve life-threatening situations. These are, however, embedded in the uncertain nature of vital-existential conditions.

From this perspective, as Jonas (2000) aptly points out, although living under uncertainty increases life's precariousness and necessitates adaptation, a substantial body of empirical evidence to date demonstrates that this adaptation doesn't always occur for mere survival but rather for the sake of living more. By "more," we mean in terms of experience, not temporality. This applies not only to humans but also to various human experiences, including socio-historical aspects, both on individual and collective levels.

In essence, we can understand that while reducing the complexity of the world, the cognitive-meaning duo plays a crucial role in reducing uncertainty and life's precariousness. This aligns with the classical autopoietic postulate of all-or-nothing survival (Maturana and Varela, 2009; Weber and Varela, 2002). However, this duo also plays a central role in less transcendent tasks that are nonetheless necessary due to their everyday nature, as they explain the vital interest of living beings, especially humans, in experimentation throughout their lives⁸.

This essentially forms the philosophical foundation of the notion of a cognitive agent (Di Paolo, 2009, 2015), from which the sense of cognition as perceptual action imbued with purpose becomes clear. Every perceptually significant aspect of the world becomes relevant for the agent's cognition due to its orientation toward objectives and goals, whether they are vital (Weber and Varela, 2002) or of an experimental nature (Jonas, 2000, Di Paolo, 2015).

In simpler terms, this portrays the cognitive-meaning duo as an inherently purpose-driven cognitive action or, in other words, as an action aimed at seeking meaning (Weber and Varela, 2000). It is a

natural, spontaneous action that is embedded in living, can even occur unconsciously and beyond language (without excluding the opposite, of course). Nevertheless, because it is mediated by bodily corporeality and the perceptual and sensorimotor capacities of individuals, it originates within a basic, metabolic —and as Damasio suggests (2018), even neuroaffective— matrix of meaning. This matrix is, nevertheless, updatable through the interactions that organisms engage in with their environment throughout their lifecycles.

Thus, cognition, as Varela (2005) and Varela, Thompson, and Rosch (1997) point out, is a perceptually inscribed action or movement that enables the subject to bring forth a world that emerges imbued with meaning based on how the corporeality and perceptual capacity of the subject, with its extents and limitations, are implicated in this emergence within a specific and situated experience. In this regard, being self-referential operations, this meaningful world is nothing more than the result of the subject's interested perceptions, whether circumstantial or habitual, in the world and what has been relevant in their interaction with it. Therefore, interest, perception, and corporeality constitute the foundation of cognition involved in all meaning.

Taking into account that according to enactive theses, one does not act because one perceives, but rather the other way around: one perceives because one acts, it is plausible to argue that no action, act, or cognition occurs *ex nihilo* but rather in an interested manner, circumscribed by the circumstances of the experience and the extents and limitations of corporeality implicated in said experience. From this perspective, it becomes easier to understand the enactive definition of cognition as enactment, understanding this as a cognitive operation. Thus, the duo of cognition and meaning constitutes a mechanism for seeking meaning, where meaning is conceived as a natural management of the living action-cognition (Di Paolo, 2009; 2015).

Meaning, as understood here, is a condition of cognition, and vice versa. Just as all enacted cognition is a cognition born imbued with self-referential meaning, all meaning configured from the perception implicated in lived cognition is always meaning produced from the natural and inescapable performance of the agent in the environment they inhabit. It is for this reason that, within enactivism, cognition/signification constitutes a mechanism for adapting to the environment.

As can be seen, the above reinforces our hypothesis regarding the mediating nature of cognition and meaning in an individual's life. This hypothesis is closely related to the general premises of the semiotics of life, from Jakob von Uexküll, through Thomas Sebeok's zoosemiotics, to Jesper Hoffmeyer's contemporary biosemiotics. Moreover, it characterizes, as these approaches do, the

active nature of living organisms in terms of cognition. It is this active nature that allows Di Paolo (2015) to refer to these organisms as agents, i.e., cognitive agents, capable not only of displaying agency but also cognitive adaptability. In the case of humans, cognitive agency and adaptability manifest primarily in sociocultural environments, where social pedagogy processes occur, both at the institutional and non-institutional levels. These processes also manifest in social environments where the cognitive action of participating subjects—in what Froese and Di Paolo (2011) refer to as the coordinated action between cognitive agents—takes the form of what social sciences term collective action.

In collective action among individuals in the social realm, intersubjectivity becomes an unavoidable property of the collective sense. Although social sciences predominantly conceive intersubjectivity within conceptual frameworks where memory, representations, and imaginaries are the breeding grounds for the historical-social-cultural domain, it is precisely here where the paradigm of the 4E's offers a different perspective to consider the role of collective meaning beyond dominant constructivist traditions about culture, history, and society as ultimate foundations for the production and deployment of social sense as intersubjective sense.

Given the significance of this for our work, a reflection on intersubjectivity as collective sense is constructed below, aiming to contribute to an understanding of how the duo of cognition and meaning operates in the social sphere, producing socially collective meanings that are not only differentiated but also autonomous concerning the subjective in question.

3. Enacted meaning in situations of social action and interaction

As we have previously argued, from an enactive perspective, the duo of cognition and meaning constitutes a natural mediating mechanism for any cognitive agent in relation to the world it brings forth, thereby enabling adaptive action within it. Based on this, the notion of adaptive agency—referred to as such by Di Paolo (2015) to distinguish it from the evolutionary sense of Darwinian adaptation—accounts for how the dynamics of cognitive changes in an agent's internal states allows them to display autonomy in action.

The aforementioned firmly anchors the relationship between cognition and action in the management of life, not only in terms of survival but also in terms of expanding the possibilities of action for agents. This expansion, as noted in the relevant literature, occurs even if it jeopardizes life⁹ (Jonas, 2000; Di Paolo, 2009, 2015). Therefore, the emergence of the world arises as a consequence of

explorations and pursuits that frequently shape uncertain and challenging actions¹⁰, which fundamentally constitute the starting point for any cognitive transformation and, therefore, for action.

As previously mentioned, drawing from Jonas's (2000) theses about the cognitive capacity of an organism to connect with the environment based on the meaning that environment holds for it, Di Paolo enables cognition as an agency of living organisms. However, according to the author himself, this agency is the driving force behind their freedom (Di Paolo, 2018). Thus, it is evident that, from this author's perspective, it is possible to counteract the biological determinism that is somewhat inherent in classic Varelian enactivism and which understandably raises concerns among social scientists.

The concept of autonomy, which in classical enactivism was linked to autopoiesis as a mechanism for self-production and self-organization ensuring identity and survival, takes on a different role in contemporary enactivist perspectives concerning the adaptive conception of agency. Thus, the freedom implicit in the notion of adaptive agency allows the cognition-signification pair to be thought of within a dynamic of cognitive, action, and identity changes linked to the phenomenological nature of life. Here, the openness and disposition of cognitive agents to experimentation and error, failures and mistakes¹¹, are an integral part of their lived experience.

Moving away from survival scenarios, for contemporary enactivism, cognition and signification become everyday functions of experience in which the freedom of agency is displayed, or in other words, the autonomy of an agent to act. This allows enactivism to suggest that the more diverse an agent's actions become, the greater their increase in cognition and vice versa. Similarly, the more freedom or autonomy an agent has to understand/signify the world, the greater the possibility of configuring reinscriptions in their identity and the higher the increase in cognitive adaptivity and potential for action.

This is particularly relevant to the social sciences in terms of thinking about how human social actions can be regulated and even restricted in terms of social pedagogy through control and discipline, not only of actions but also of bodies and experiences. The fields of feminism, queer theory, and anthropology have discussed this for several years, focusing on the emotional aspect.

However, these approaches have a strong culturalist root, explaining how culture plays a role in the reproduction of ideologies that contribute to maintaining social order through the deployment of

practices of domination and submission. These practices can be characterized as values or meanings and actions that reveal a lower or no increase in the diversity of actions and cognition–signification of social agents, resulting in less or no possibilities for identity inscription and cognitive adaptivity.

From the perspective of enactivism, it's essential to understand the cognitive processes underlying social transformation events. These events could be seen as processes of subjective and intersubjective cognition occurring within the natural processes of changing cognitive states that are forged during life experiences and which give rise to actions/cognitions of resistance to power and the status quo.

In the social sciences, when resistance events are understood only as identity claims or as responses to domination, there's a lack of focus on the cognitive experience of individual and collective social agents. This overlooks the situated, socio–historical nature of action experiences, hindering the emergence of a comprehensive analytical perspective that emphasizes signification as a process of meaning production, which is cognitively engaged both subjectively and intersubjectively in the historical constitution of social order.

It's important to see these processes as a stage for cognitive changes in and between agents within their individual and collective life experiences or interactions in a given socio–historical cultural order. The nature and extent of these changes will determine the expansion of the agents' freedom or autonomy to act, understand, signify, and resubstantiate the world. This is the way to bring about a different world, based on new values that reconfigure an agent's identity, as well as a accumulation of experiences and meanings that shape their cognitive history and memory.

From this perspective, adaptive agency is not only the explanatory basis for signification concerning the emergence of changes in the production of differences and relevance about the world in relation to the agent, but it also explains the impact these changes have on their identity—essentially a cognitive identity—and, consequently, on their actions.

Therefore, the basic recursive loop that is inscribed in the autopoietic nature between action and cognition provides a foundation for thinking about adaptive agency within the social context. This context is where the interaction between individuals perpetually configures a network of possible mutual disturbances and modifications, which act as a stage for the deployment of their adaptive capabilities, meaning their cognitive–action freedoms.

This is why the cognitive nature of the concept of adaptive agency (Di Paolo, 2009), a concept derived from the combination of cognitive agent and adaptive agent, is particularly fertile for considering

social action and interaction as the substrate for the emergence of a network of disturbances and modifications in terms of self- and co-regulation of behaviors.

3.1. Human Social Interaction from an Enactive Perspective

In both Di Paolo and Froese (2011) and De Jaegher and Di Paolo (2007), self- and co-regulation processes of action are defined within social interaction situations, where the coordinated participation of cognitive agents is crucial for the emergence of intersubjective meaning in the world. Therefore, the self- and co-regulation processes of coordinated action by participating agents create uniform or similar action-cognition-signification experiences. This characteristic is the property that allows for the discussion of intersubjectivity, both in terms of collective sense production through perception and in terms of the emergence of a world of collective meanings as a result of this production (De Jaegher and Di Paolo, 2007).

This implies that for human cognitive agents, intersubjectivity is linked to their behaviors in specific historical and concrete situations of social interaction. This leads to the notion that the self- and co-regulation processes of action in which intersubjectivity emerges as a collective sense are influenced by different variables than those considered in enactive experiments and research. Consequently, enactive perspectives on intersubjectivity need to be adjusted to the singularities of human cognition and the interplay among the multiple environments in which human cognitive agents act as part of their existence.

This means acknowledging that intersubjectivity is not only the product or result of symbolic meanings previously established and constructed within culture. This is how the concept of intersubjectivity is traditionally understood from the social sciences due to the representational heritage of classic cognitivism that underpins the dominant constructionist approaches to society¹². Intersubjectivity also emerges as a collective world of meaning based on how individuals, through their own bodies in action, produce meanings about the world as part of their collective experience of self- and co-regulation in social interaction.

With this understanding, it becomes clear that the cognitive autonomy of human agents, which is known to be involved in their individual and collective action possibilities, is directly connected to culture, narratives, beliefs, meanings, and values that form the social sense of social action. The reason for this is that human cognitive agents are born into a cultural matrix that precedes them and from which they cannot escape as an essential part of their identity formation. This does not negate

enactive theses about lived cognition as action but requires inferring that this preexisting world of meaning, which constitutes culture, is, in principle, a world of meaning that, by conditioning individual and social actions, also conditions the scope of cognition.

For example, we can assert that the stabilization or transformation of a social order takes place through the reproduction, resistance, or subversion of meanings that support the practices of social agents in social interaction. However, it is also important to understand that these meanings, culturally speaking, must be congruent with their identity. If one considers that congruence between meaning and action relates to the self- and co-regulation processes of action present in collective behaviors that occur in social interaction, it is logical to think that the way these self- and co-regulation processes happen can explain the relationship between the impact of collective action on the possibilities of inscription and reinscription of individual and social identities and the historical tension that arises from social relationships among the agents and the social identities from which they participate in interaction.

In this sense, even though the concept of mutual affectation serves as the conceptual foundation for defining social interaction (Di Paolo and Froese, 2011), which is characterized in terms of the self- and co-regulation of individual behaviors within collective action (which, for the authors, is coordinated action), this definition of social interaction can be applicable to human cognitive agents and their socio-historical contexts of action and interaction as long as social interaction is understood as an instance for subjective action in participation. This action facilitates the configuration and reconfiguration of social agents' identities through mutual affectation (disturbance, modification, incidence) that arises in these interactions.

Hence, while acknowledging that a world of meaning precedes us and has a normative and guiding nature that impacts our actions, cognition, and identity, enactive theses are valuable in making visible the fact that humans are born with the capacity for will and consciousness. These qualities, as Fuster (2016) aptly points out, are the foundation for the biological and moral exercise of freedom. It is this essential autonomy in their actions and cognition that allows individuals to manage their lives in their living environment and to create, or contribute to creating, not only how they want to live but also the desirable environment in which to do so. This emphasizes the importance of identity configurations and cognitive correlates in expanding and increasing the possibilities of individual and collective action and signification for human cognitive agents through education and pedagogy. As Bourdieu and Passeron (1996) highlighted, these are mechanisms of indoctrination within power relations.

The above highlights that the cognitive processes of self and co-regulation of action within socio-historical situations of social interaction are more complex than those postulated by enactivism for organisms with lower cognitive complexity. Therefore, even though collective behaviors can be described as coordinated and co-participatory actions, the nature of mutual involvement characterized by the prefix "co" must be understood through the lens of difference and inequality. These differences manifest in the form of degrees and levels of mutual impact due to the historical tension within the relationships and interactions among agents with different social identities. It is worth noting that this tension may not always be present, as Simmel (2014) pointed out¹³.

From this perspective, collective action cannot be defined solely as action oriented toward coercive or purely collective interests. It must be defined as the result of the dynamics of unequal mutual impact among individual and collective social agents in social interaction. In socio-historical situations of social interaction, the adaptive agency of human social agents can take on forms of continuity or rupture, enjoyment or power, depending on the dynamics of interaction within a specific context.

While we agree with enactivists that the dynamics of mutual impact in all interactions lead to the transformation of identities, meanings, and actions of social agents, we also emphasize that, just as these aspects can change, they can also stabilize, reaffirm, become fixed, or even become entrenched. For instance, as suggested by Froese and Di Paolo (2011) and Di Paolo (2015), habits function as repetitive actions that tend to ensure the functional stability of a coupling. This stability can occur at various levels of an organism's autonomy. In this way, through mutual impact, social agents, like any cognitive agent, connect their being and doing in diverse and unequal ways, influenced by multiple factors.

Egber, Barandiaran, and Di Paolo (2010) propose that adaptive agency allows organisms to mediate cognitively and significantly between their self-constitution and the social regulation of their behavior. While we concur with this, especially as it pertains to the transformation of identities, meanings, and actions of social agents, we believe that, for human agents, this participation should be understood socio-historically and thus, as unequal participation.

In light of this, and in line with enactivist theses, we define social interaction as the stage for the relational deployment of cognition among agents based on their individual or group interests, as well as the origin of an autonomous structure of intersubjective meaning. However, unlike enactivism, due to its socio-historical implications, for human beings, this autonomous structure of intersubjective meaning cannot be explained solely through the coordination of social agents' behaviors in

coordinated participation. In any case, this participatory coordination could explain certain forms of "stabilizing couplings," marked by power, tradition, roles, inertia, or customs that lead to certain habitual behaviors¹⁴.

As Froese and Di Paolo (2011) point out, the participatory coordination of agents in social interaction allows for the collective construction of intentions, actions, and mental states, resulting in intersubjectivity. This intersubjectivity, according to the authors, is an autonomous structure of meaning that emerges from the mutual impact implicit in changes in sensory stimulation that occur within the internal relational dynamics between the sensorimotor systems of agents in interaction. However, it is crucial to understand that, for human agents, intersubjectivity is not uniformly harmonious. Instead, it is marked by diversity and inequality.

In our view, it is essential to acknowledge that intersubjectivity represents a relational cognitive domain that, for human beings, arises from, integrates, and develops within the ideological mechanisms of social pedagogy that underpin processes and phenomena of dominance and discipline, as Verón (1998) and Fairclough (1995) understood. This is why we find it plausible to refer to participatory coordination as one of, rather than the only, ways in which intersubjectivity emerges as an autonomous structure of social meaning. Additionally, given its socio-historical implications, this coordination may be embedded in practices of unequal participation, making it challenging to rule out the presence of narratives, practices, strategies, and dispositions that reproduce power and domination. As scholars like Bourdieu with his concept of habitus, Foucault with power-knowledge, and Gramsci with hegemony have suggested, the mechanisms of power often perpetuate existing structures of dominance in both action and meaning.

Therefore, in the case of humans, any approach to intersubjectivity in enactive terms must consider the role of historicity in its constitution. While De Jaeger and Di Paolo (2007) are correct in concluding that intersubjectivity emerges relationally and naturally from the cooperation implicit in the interaction of agents in participation, their approach assumes equity in the possession of cognitive resources by agents, as well as similarity or uniformity in their biological capacities as the sole variable. In this sense, enactive research focuses on the cognition of living organisms with less cognitive and experiential complexity than human subjects. This is also reflected in the definition of a social system proposed by Froese and Di Paolo (2011) based on the cooperative thesis of participation, which is not directly applicable to the human case.

While the biological capabilities of human beings are similar as a species, we must also consider psychological capacities, abilities, and competencies as variables. These psychological aspects, although they can be understood from their biological and evolutionary components, have their origins in phenomenological configurations. Furthermore, the historical dimension of this psychological experience at individual, collective, social, and symbolic-cultural levels must be acknowledged.

Therefore, the enactive definition of a social system as a multi-agent system co-determined by the interaction/impact between its members, as proposed by Froesse and Di Paolo (2011), luckily acknowledges that the emergence of intersubjectivity as an autonomous structure of meaning can always be altered or modified in action, in line with or against the objectives and interests of the agents involved. However, this perspective cannot be complete in explaining intersubjective cognition in humans without incorporating the diversity present in the experiential, historical, and affective dimensions as an integral part of individual and relational cognition and action.

From this standpoint, the autonomy of the social realm, which enactivism defines as the structure of shared meaning constructed intersubjectively through cooperative interaction among agents in participation, needs to encompass the interplay between the two constitutive macro-dimensions of human cognition: the historical and the biological. The point of convergence between these dimensions is the human experience itself, as proposed by enactivism, which is the very lived experience of action where meaning plays a crucial role. In enactivist terms, it is within the lived experience of action that collective meaning and the meaning of the collective emerge in situations of social interaction.

Thus, it is plausible to argue, alongside enactivism, that bodies and movements naturally or culturally involved in social interaction through the intersubjective structure that emerges from it experience inscriptions and reinscriptions of identity at the individual level before the collective level. Therefore, the modifying impacts of collective action help configure the inscription and/or reinscription of individual identity from processes of inscription and/or reinscription of collective identity.

In situations where social agents have uniform individual identities, it is possible, as enactivists rightly point out, to anticipate an impact on the collective identity of individual subjects as a group. However, when dealing with human agents in social interaction, these identities are not only different and differentiated but also unequal. It is likely that this inequality will result in uneven and varied

impacts, highlighting the fragility of notions of collective identity and raising ontological issues related to their abstract and generalizing character.

These considerations do not negate the existence of an intersubjective structure of shared meaning, commonly referred to as the common-sense world, as defined by Martín Algarra (1993). In fact, it is essential to recognize that in human social interaction, knowledge is not solely produced through the interaction between acting bodies but also through the intentions and mental states of agents, both individual and collective. These agents mutually affect each other through their sensorimotor systems via the sensory stimulation, and this process forms a part of the shared cognitive structure. However, it is vital to consider that, in the experience of human interaction, the conjunction of biological, psychological, and historical factors produces differentiated and unequal meanings about the perceived world, both individually and collectively. These meanings also impact the different levels of identity formation among the agents. Examples of this complexity can be observed in the realm of gender identities.

As we have argued in previous work, human beings act and interact within at least three different environments: the biological or natural environment, the social or socialization environment, and the symbolic or cultural environment. The interaction with these environments gives rise to the agent's meaningful ecosystem, where individual and collective meanings converge, at times intertwined. These meanings are not exempt from tension and conflict, making the universe of these meanings complex and occasionally contradictory. This universe contains both conscious and unconscious meanings, anchored in the historical-collective, family, personal, and even genetic memory.

As can be derived from the legacy of affective neuroscience (Damasio, 2011) regarding the adaptive and cognitive role of emotion, and even from psychological theories where affect is the primary criterion for self-sense (Castilla del Pino, 2000), for human cognitive agents, meanings have an affective dimension that influences the construction of feelings and beliefs. This is valid not only for meanings about the world but also for meanings about others, particularly their agency and identity, as well as self-identity¹⁵.

With this in mind, defining meaning from lived or enacted cognition as a sort of lens, focus, or perspective for perceiving and understanding the world, others, and the self involves understanding it within the complexity of its multiple dimensions, which are embodied in the identity of the acting and interacting agent.

While the autonomous nature of preexisting meanings (often structured in the form of memory, imaginaries, rituals, beliefs, traditions, and values) enables a complex understanding of the intrinsic dynamism and tension inherent in the subjective production of meaning, human action's freedom and will allow for the management of this tension over time, without necessarily subsuming subjective knowledge and meaning into the intersubjective realm.

In situations of social interaction, human action/cognition cannot only be defined by the superimposition of intersubjective meanings emerging from the processes of self and co-regulation of sensorimotor systems through the cooperative action of agents in participation and those intersubjective meanings that preexist or pre-date the historical-sociocultural dimension of meaning, where interactions are inscribed as social events or occurrences. It's also essential to consider that human freedom and individual will enable the transcendence of the cognitive-identitarian constitution of subjects and their subjective action.

Thus, social interaction, even when intersubjectively articulated, cannot be understood as a unified, defined, and fixed action. At least from the enactive perspective, individual cognitive agents explore, experiment cognitively, and establish new limitations and possibilities to exist and act, which explains the unpredictability and uncertainty in cognition/action processes. This enables the transformation of existing meaning and even the invention of new meanings. From this standpoint, we believe that the invention/transformation of meaning implies the invention/transformation of life, the agent's identity, their action/cognition, and consequently, the very meaning of the environment. Therefore, meaning, whether intersubjective or not, is always in constant flux.

This is the essence of the argument that allows us to claim that subjectivity and intersubjectivity constitute different but overlapping domains of meaning through the action and interaction of agents. It also allows us to assert that meaning in any of its variations is the primary arena for the deployment of adaptive agency by human cognitive agents in their everyday lives.

As mentioned earlier, in situations of human social interaction, this deployment is uneven and unlevel due to the bio-psychological and historical-symbolic differences in the production of subjective and intersubjective meanings. These meanings serve as instruments of action/cognition and identity formation, through which a specific social order is reproduced or transformed by stabilizing or altering the cognitions, actions, and meanings on which it is based.

This explanation helps to understand human social action as primarily cognitive in nature (incorporating the affective dimension of cognition, which enactivists don't consider), and it

demonstrates how meaning plays a fundamental role in the historical constitution of the social, its processes, and events of stabilization and transformation. This aspect is further elaborated on in the final section of this text.

4. The Role of Significance in the Historical Constitution of the Social

As seen in the previous sections, we have reflected on how meaning is implicated in the mental constitution of a subjective and intersubjective world of cognitive agents, whether human or not. We have also shown how meaning operates within a dynamic of implicit changes in the relational and experiential logic between action and cognition of human agents in social interaction.

In line with the enactive legacy, we can conclude that meaning reveals an interpreted world, which, in its self-interested perception, not only establishes—putting it in Wittgensteinian terms—its scope and limits based on its own constitution dynamics (revealing its fractures, contradictions, and possibilities) but is essentially produced contingently. Regarding cognition and meaning, it is always, in addition to being self-referential, potentially ephemeral and unfinished.

It is a world that is perceived, and it's important to clarify that neither from enactivism nor from the theses advocated in this text, do we refer to the existence or non-existence of a real world—if we can call it that, referring to the physical conditions that make up the material substrate of existence—because the perceived world is everything that shapes access to the existence of that real world, of which we can only know through ourselves and the instruments we construct for that purpose. Mediated by the self-reference of meaning, corporeality and its action, the perceived world is not only the world that agents produce, but it is the world that exists and can exist for them.

From this, we have developed a concept of meaning as cognitive mediation from which the perceived world, and from which the agents act as they live it, is a virtual and ever-changing world by its very nature. It depends on various and multiple aspects involved in the vital existence of the subject and also on the contingency of their action. However, we have also reflected that, despite this changing nature, precisely because this world is a world of meaning, it can stabilize thanks to both the accumulation of perceptual regularities and the emergence of habits in action, ontologically configuring itself, i.e., with an existence that conceals the role of subjective and intersubjective cognition/meaning in its constitution.

In this sense, we have concluded that the stability or instability of the meanings of the social world, and in the case of humans, how these meanings are involved as self-meanings, while they do not constitute the real reality of the world, they do participate in the perceived reality that arises from individual and social action emerged from and fed back by the meanings that emerge from the cognitive operation of the agent in that world through action.

Therefore, based on these partial theoretical and conceptual results, it is possible to argue that the processes of the historical constitution of social reality take place through a procedural dynamic of changing social action, uneven, unequal, and configured through social events and events whose nature is not only essentially cognitive but intrinsically experiential. Therefore, we believe it is important to articulate the enactive legacy about lived cognition and the transposition we have made of these theses to the field of human social action with the concept of social reality presupposed by Zemelman (2009).

Understanding that for Zemelman, social reality is a concrete configuration that is permanently unfinished and emerges from the totality that virtually inhabits the different and infinite possibilities of action by social agents, the Zemelian concept of social reality, with a strong dialectical foundation, represents for us one of the most realistic approaches to the movement that characterizes all social reality through the processes of action/cognition.

But there is more: although the author does not explicitly state it, his thinking allows us to understand human social action as a performance involving social agents (for Zemelman, subjects), preexisting circumstances or conditions of reality, and the parameters that are broad frameworks—and even unconscious—of meaning that guide but do not determine the action, and have been generically named by De La Garza (2018) and in a somewhat confusing way also as meanings¹⁶.

However, even though it is not clear what type of meanings both authors refer to, the fact is that, while they think of them as preexisting meanings, i.e., as cultural formations or configurations of meaning that are stored in intersubjective historical memory, they also acknowledge the possibility of their transformation through action based on the inherent potential for change they contain.

Thus, social action can be explained as a perennial movement in the given or preexisting, but whose direction, consequence, and impact as a movement happening is not only potentially unpredictable but also presupposes social reality as an emergence. In this sense, social reality is not understood as

the given or as the happening, but as the happening in the given (Zemelman, 2009), where meanings specifically structure, expand, delimit, or create the movement, the action.

As it is a movement that is primarily bounded through an oscillatory dynamic between highs and lows, it is not possible to claim that action depends entirely on subjects, circumstances, or even on meanings themselves, but on the internal dynamic of their interrelationship, where we consider the will and freedom of the cognitive agent to be anchored, as presented by the enactivists.

Thus, considering that circumstances, even if stable in time-space, are not determined once and for all due to the active intervention of subjects in action/interaction and the dynamic nature of the meanings that contribute to shaping it, it is reasonable to argue that actions, as ritualized, naturalized, institutionalized, and structured as they may be, can also be transformed as the experience and identity of individual and group social subjects change.

With meanings, of course, the same happens. Some of these meanings are structured from the outside, creating narratives of stability, conservation, and reproduction of a particular order (these are usually preexisting meanings, whether hegemonic or not). However, there are other meanings that emerge from subjective and intersubjective experiences and cannot be structured in terms of meaning from dominant meanings. They are born resisting or denying them, usually incoherently in terms of identity (remember that collective identities are usually heteroassigned and even self-constructed identities require external validation to become an identity). They dispute the space of identity legitimacy that they seek to claim precisely to build a narrative structure that makes the world legible from their coherence.

From the perspective of social reality proposed by Zemelman, meanings become the battleground for this dispute over social order. This implies, in turn, not only a struggle for the legibility of the world but also for the legitimacy of the experience in which cognition, action, and identity make sense. The climate crisis, with both climate change deniers and non-deniers on opposing sides, the global women's movement and all its feminist, trans, and anti-feminist branches, the Russian invasion of Ukraine, and any other phenomenon in which social or political disputes are involved represent, at their core, a struggle for legitimate meanings. In other words, it's a battle for the possession, preservation, and reproduction of a regime of knowledge and truth, as Foucault (1992) aptly points out.

This is why we agree with Zemelman (2009) that the autonomy of social reality, as a concrete totality, is always an autonomy sustained by intersubjective parameters of meaning. These parameters allow

for the reading, interpretation, or understanding of a specific configuration of social reality as a fact, even when it is nothing more than a crystallized configuration of the movement from which it has emerged as a possible reality, based on social and historical circumstances (in terms of spatiotemporal, symbolic, and experiential circumstances that underpin action¹⁷).

According to Zemelman, social reality emerges with its own autonomy, which is the result of historical articulations and tensions arising from certain circumstances in the social action/interaction of individuals in the present. It's an autonomy that, as the author suggests, reveals the unprecedented, inherently dynamic, unpredictable, and unfinished nature of social reality, encapsulating in this characterization the basis for thinking about transformation. From the perspective of enactism, the relationship between the natural dynamics of social reality through action is interdependently related to the active nature of cognition.

However, while Zemelman limits the argument about the autonomy of social reality to the emerging configuration of historical meanings involved in action through the activation of collective historical memory, enactism paves a way to consider the superimposition of these already-lived and produced meanings (often structured as culture) with those that are being experienced, produced, and structured in action/interaction as a collective experience in the present.

This is where Zemelman and the enactists envision transformation: Zemelman as a possibility within what is, and enactism by demonstrating that every experience is, in itself, a cognitive experience that modifies the identity of the agents, as well as their possibilities for cognition, action, and meaning. In this convergence, we postulate human cognition as an instance of freedom and choice where there is a struggle, replacement, affirmation, denial, resistance – not necessarily congruent and conscious, not necessarily linear and strategic – in the interest of the legibility of the world, which is necessary for survival and for managing life in everyday experiential scenarios.

This instance of freedom and choice in cognition reveals the cognitive tensions that fracture between symbolic representations (pre-existing) of the world, the meanings that configure the memory of intersubjective historical experience, and those that are produced subjectively and intersubjectively through the action. Because, as explained earlier, cognition is a learning mechanism involved in adaptation and experimentation. In our view, this is what the enactists' theses suggest about the cognitive agent and cognition as a capacity for adaptability.

In this sense, we can confirm that meaning, as a mechanism that produces cognitive differences and relevance, is involved in the daily management of human agents' lives. It allows them to manage life for purposes related to survival and for the experimentation of existence itself. Therefore, the ontological functionality of the cognition/meaning pair allows us to affirm its role in perception, which inevitably arises from experience.

This cognitive operability of meanings is one of the most contingent and dynamic constitutive aspects of action, which is what allows us to grant historical specificity to social reality from its intrinsic constitutive dynamism. From this point of view, meanings. Cognitively speaking, meanings play a role in the emergence of a socially constructed reality, making it possible for the dispute among social actors for the legitimation of their identities, the meaning of their actions, and the world they perceive through them to also ensure the legitimacy of the legibility of the world based on intersubjective historical memory. This holds true whether it's a hegemonically legitimized legibility or an alternative one¹⁸. As Zemelman (2009) points out, every social reality is essentially a specific configuration of unpredictable articulations that take place among the various possibilities of action by social actors.

For the author, this specific configuration takes place through the way a previous or predetermined reality – stable, we might say – regulates and limits the actions of the actors within a specific framework of action. However, it is always disrupted by the dynamism of action, which has the potential to free it from constraints, namely the limits of its existence. This is why, according to the author, the actions of social actors always configure as possibilities for change or continuity, whether they involve small changes that, through accumulation and in accordance with the dialectical imprint of Zemelman's thinking, gradually make possible the gestation of a large-scale social transformation.

From this perspective, the unpredictability and uncertainty of action seem to depend on the cognitive capacity of social actors. However, for Zemelman, it is more about how the action of the present projects into the future based on the collective intersubjective and historical experience that shapes possible actions through the interplay between memory and circumstances. This is the dialectical logic that Zemelman's thought unfolds from the given-dating Hegelian framework, and it also underlies his concept of social reality as a kind of concretized virtuality.

It appears clear that the logic of the given-dating demands an understanding of the possible as virtuality, where possibilities, as possibilities that can be and not be simultaneously, depend on the intrinsic dynamism of action in a specific social configuration. Thus, while these possibilities are

always historical, they are also always virtual, nonexistent in the configured reality but possible in the yet-to-be-configured reality (Zemelman, 2009).

This is why the crystallization of certain possibilities, their concretization as actions shifting from possible to tangible, operates in the logic of the given-dating as the emergent constitution of a social order. As mentioned earlier, this order not only stabilizes relationships, roles, positions, and identities within a more or less coherent structure of intersubjective meaning but also renders the world legible, establishing it as an order of meaning that ontologically stands as reality through the cognitions and meanings that structure beliefs, values, and knowledge about the world, the other, and the self, until social action itself perturbs it again and eventually modifies it.

Thus, the crystallization of reality through the more or less stable structuring of a particular order of meaning shapes a knowledge that impacts the constitution of that reality, both at an individual and collective level, and this accumulation is stored in collective and historical memory in the form of narratives, symbols, practices, rituals, unconscious actions, or practical knowledge. Given the perpetual and unpredictable dynamics of social action and interaction that make social reality, the existence of this crystallized order of meaning does not cancel or cannot cancel the constant disturbance exerted on this knowledge through action.

From this perspective, it must be admitted that any crystallization implies fragility or vulnerability because, if action is understood as a pragmatic "becoming" (Thévenot, 2016) or as "given-dating" in Zemelman's terms, it is precisely this constitutive dynamism of action that enables, if not transformation, at least the disruption or fracture of the order. This paves the way for individual and collective actions of resistance, negotiation, and dispute that inscribe themselves in the historical processes that bring about social change.

Furthermore, considering that action is always an experience, and experience is always perception (Gallagher and Zahavi, 2013), it is plausible to claim that these processes that bring about social change also reveal the cognitive tension, both at an individual and collective level, in the experience of action, in the experience of life. It is precisely within this tension that the search for the meaning of signification takes place since meaning is implicit in perceptual processes that simultaneously produce a world of relevance based on the experience of action and social interaction, thereby influencing the constitution of orders of meaning and individual and collective reality simultaneously.

Whether through repetition or substitution, the production of subjective and intersubjective meaning constitutes the driving force behind the dynamism characterizing social reality as concretized

virtuality. Thus, it is within the realm of perception that the process takes place, allowing the agent to construct a self-referential world of meaning that enables the emergence of conscious and unconscious significations. This process shapes cognitive memory based on the history of the meanings experienced in interactions.

From an enactist perspective, interactions are structural couplings of the agent. In the case of humans, these couplings are understood as the more or less random, circumstantial, and yet stable interweaving of meanings at the biological level (encompassing metabolic and psychological aspects) and the social level (which involves the emotional and logical dimensions). At the sociocultural level, the symbolic-cultural and historical logic is intertwined with language.

With this in mind, it is reasonable to affirm that the conscious and unconscious dimensions of perception are activated in any social action. It is in this practice that the perception of the world emerges, shaping the experience of action as reality based on the relevance it holds for each agent or group of agents. This then configures the reality within the action as it emerges.

In this sense, social reality essentially emerges not only from the implicit possibilities of action in the interaction of agents based on the interdependent relationship of the physical, mental, and relational capacities of the agents on the one hand, and the history of their given social relationships through interactions and perceptions on the other hand. It also arises from how these possibilities reveal the production of meaning about the world, and in the case of humans, thanks to their self-reflexivity, about the position of the agent in relation to the world (its objects, logics, situations) and others as separate entities. This helps to understand the role of meaning in the historical constitution of reality and perceive social reality as contingent, random, uncertain, ephemeral, and novel.

This dynamic of the social world is noted not only in its constant movement but primarily in its unpredictability, arising from the very movement itself. This is what, in our opinion, makes the movement of social reality intrinsic in the action of agents, and it is explained from an enactist perspective through the concept of adaptive agency that describes the autonomy of agents in acting while exploring the world experientially. This movement or action, despite its regularities and habits, is always potentially unpredictable and contingent.

5. Conclusions

As can be appreciated, the hypothesis we have constructed regarding the role of signification in the historical constitution of social reality from enactive theses discards the biological determinism that has formed the core of criticism against enactive proposals. Simultaneously, it values situated perception in the experience of action as a process of ontological cognition/signification. It doesn't deny the existence of a world beyond the cognitive agent but recognizes the mediation of this process in its virtualization. In this sense, our hypothesis also dispels the risk of solipsism present in many hermeneutical approaches concerning the role of subjectivity in explaining the social.

Thus, both these dismissals, aligned with the resolution of the internal/external problem that enactivism has contributed to, allow us to discard not only an anarchic, libertarian, and atomized conception of social reality, which typically places the phenomenon of social transformation on voluntarism but also to reject those conceptions of social reality as pre-existing structures of social relations without the potential for transformation. As we have posited before, social reality emerges from the perceptual contingencies of agents in interaction, and it is from this that it crystallizes as a social form with some degree of stability through implicit and sustained coordination in processes of self-regulation and co-regulation of perception involved in the collective and individual behaviors in social interaction among human agents.

As can be seen, it is the phenomenological nature of the dynamics of social constitution that allows us to question the very idea of social reality as a fact, especially as a unified, stable, and given fact once and for all. This leads us to consider the concept of its constitution towards scenarios of inconclusiveness, fragmentation, porosity, impermanence, chance, where transformation is possible precisely because of the contingency of perception, cognition, and action.

This notion, which goes against conceptions of the context as something external surrounding or referencing the subject and their action, necessarily affirms that action, reality, and context are entities that specify each other due to their interdependent properties and, above all, they are cognitively co-determined. This allows us to understand the historical constitution of social reality from this cognitive imprint of action, not as a process but as an ongoing process. In our view, this uniqueness is what shows not only the superimposition of different perceived realities interconnected at different degrees and levels due to the potentially infinite diversity of their virtual possibilities for

concretization in action but also how signification, from a cognitive and historical perspective, participates in the constitution of what we call and understand as reality.

Footnotes

¹ I hold a Ph.D. in Social Communication from the University of Havana, Cuba, and have more than 25 years of experience as a teacher and researcher in the fields of communication and the social sciences. I have contributed professionally in Cuba, Mexico, Colombia, and Peru. Currently, I work as an independent teacher and researcher through Toroide Communication Center. In recent years, my work has focused on the epistemology of communication from a phenomenological perspective and its impact on the historical constitution of social phenomena. My most relevant recent publications on this topic include: "La propuesta bio-histórica-fenomenológica y su pertinencia para el análisis histórico de lo social" in CONEICC XVIII(1), 2021, Mexico; "Communication and Evolution" in Carlos Vidales and Soren Brier, *Introduction to Cybersemiotics: A Transdisciplinary Perspective*, Springer, 2021; "Communication and Emotion: Non-Sociocultural Reflections" in *Anthropology and Ethnology Open Access Journal*, 5(2), 2022. You can reach me at vromeu.romeu@gmail.com for further contact and inquiries.

² For a quick reference regarding this statement, it is interesting to note the staunch defense of emotional constructionism in the social sciences by David Le Breton in "Antropología del cuerpo y modernidad," published by Nueva Visión, Buenos Aires, 2002. However, one can also find an approach to this perspective through the critical framework proposed by Eduardo Bericat in "Emociones," available in *Sociopedia.isa*, 2012.

³ To avoid delving into a topic related yet independent of the goals of this text, we briefly mentioned the relationship between methodological individualism and enactive cognition but consciously excluded a detailed explanation of the connections between the two.

⁴ The enactive approach aligns with the developments in peripheral neuroscience that start from the mind-body unity to address not only the processes of biological formation of emotions but also the cognitive operation of decision-making based on this unity. For reference, you can explore works such as "Y el cerebro creó al hombre" by Antonio Damasio (Paidós, Mexico, 2015) and "The Emotional Brain" by Joseph LeDoux (Simon and Schuster, NY, 1996). Furthermore, the enactive contribution is consistent with the development of psychological theories regarding the construction of the self,

which place affective processes as the bridge between biology, psychology, and history. You can find insights into this in works like "Teoría de los sentimientos" by Carlos Castilla del Pino (Akal, Madrid, 1996). Additionally, the enactive approach is in harmony with research in the field of social neuroscience that specifically focuses on the processes of neurological and cognitive construction and constitution of intersubjectivity from an individual perspective. For a deeper understanding of this, you can refer to articles like "Social Neuroscience: Understanding the Pieces Foster Understanding the Whole and Vice Versa" by John Cacioppo, published in the *American Psychologist*, 11, 819-831.

⁵ As an example of this criticism, you can refer to Agustin Ibanez's work titled "De la célula a la mente" published in *Psyche*, Volume 14, Number 1, pages 107-120 in 2005.

⁶ The concept of "act" and "inhabit," in the same terms as Ingold points out, i.e., as an ongoing "living" experience, whose foundational dimension is inscribed in the processes of transformation of both the environment and communities and individuals. For a more in-depth understanding, it is recommended to consult Tim Ingold's work, "The Perception of the Environment: Essays on Livelihood, Dwelling, and Skill," published by Routledge in London in 2011.

⁷ These characteristics reveal a background of theoretical and methodological differences among the various perspectives on studying cognition as action (autopoietic enactivism, sensorimotor enactivism, and radical enactivism). However, we have chosen to set these aside in this text as they are not pertinent to our objectives. For a concise overview of the explanatory frameworks that underlie each of these characterizations and their respective theoretical-conceptual projects, we recommend Mendoza Bock's paper, "¿E de la cognición: una o muchas formas de entender la cognición?" at https://www.filosoficas.unam.mx/docs/882/files/Mendoza_Bock_¿Ecognición_EA-IIfs-UNAM.pdf. In this work, we do not delve into these characteristics as fundamental differences within Embodied Cognitive Sciences (ECS).

⁸ From Jonas' perspective, which is a philosophical viewpoint on biology echoed by contemporary enactivism, it is postulated that living is not only living with an interest in survival, as interest is essential for survival, but also because living involves experiential interest in life.

⁹ This is particularly intriguing for the social sciences because it enables the construction of plausible explanations, for instance, for certain human behaviors like heroism, self-sacrifice, or risk-taking.

¹⁰ This addition to the classical theory of autopoiesis, known in the enactive approach as adaptive autopoiesis, helps to remove the autopoietic principle, which, at its core, elucidates the dynamics of

life, from being seen as a deterministic and reductionist principle governing mental activity to the logic of life preservation.

¹¹ It goes without saying that this opens up an intriguing gap for considering the role of cognition and signification in culture from naturalistic learning environments and memory consolidation from an evolutionary standpoint. However, up to this point, with the available empirical evidence, while this is suggestive, it remains mere speculation.

¹² These approaches emphasize the role of social structures in the deployment of control and coercion mechanisms, which may or may not be promoted by institutionalized pedagogies of co-regulation and self-regulation of action. These mechanisms can involve rituals, roles, customs, values, and other factors. Alternatively, they can be influenced by self-censorship, the need for belonging, or other individual and situational strategic incentives and interests.

¹³ Simmel discusses relations of sociability that are not influenced by power since they are defined by sensual interests, related to enjoyment. We have mentioned this particular aspect in scenarios of social interaction, such as those that occur in spontaneous citizen movements, but especially within communities of individuals who gather in social interaction situations driven by collective or individual enjoyment. In particular, we have analyzed these interactions within recreational cannabis consumption settings and the connection between this consumption and the development of freedom and self-determination in terms of citizenship.

¹⁴ In the social sciences, this habitual behavior, primarily linked to the social distribution of social identities and roles within social relationships, can be defined equivalently as practices or habitus.

¹⁵ In this work we intentionally omitted this topic due to its complexity and length.

¹⁶ We are particularly referring to Enrique de la Garza and his work 'La metodología configuracionista para la investigación social' (The Configurational Methodology for Social Research), UAM-Gedisa, Mexico, 2018

¹⁷ Although Zemelman is a complex author and his work allows for various readings, in our interpretation of Zemelman's thinking we believe that we can observe that meanings predominantly explain action. However, throughout the author's work, there is a sense of the possibility that action explains meanings, as postulated from other theoretical perspectives, such as enactivism. This is evident in the trilogy composed of his latest books, whose titles are emblematic in themselves: "Los horizontes de la razón," Volumes I-III, published by Anthropos, Barcelona.

¹⁸ When this legibility is constructed through narratives structured by intersubjective meanings that stabilize an order of action and meaning, they are established as truths. Ideologies, especially dominant and hegemonic ones, can be understood from this perspective. However, when from the margins of power and domination, alternative positions (such as social movements or movements of resistance and identity assertion by minorities) produce, champion, and defend alternative meanings, they strive to challenge the hegemonic ones in an attempt to expand their possibilities of action within the social order and potentially transform it, in an eternal cycle of cognitive struggle.

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