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From meaningful instructions to learned illness: Philosophical perspectives on psychopathology and the dynamics of information

SUMMARY

This paper explores the balance between stability and adaptability in cognitive development, particularly through an enactivist lens, mainly through Piaget's concepts of assimilation and accommodation and Eigen's concept of self-organization. The central idea is that while stability is necessary for cognitive resilience, adaptability is essential for handling new experiences. Psychopathology is examined as a breakdown in this balance, where maladaptive coping mechanisms prevent accommodation, reinforcing negative mental patterns. Disorders like OCD, BDD, and anxiety are discussed to show how fears or negative beliefs can become self-sustaining cycles, leading to entrenched maladaptive behaviors. The text also emphasizes that an accurate self-concept is crucial for mental health, as distorted self-perceptions can fuel psychopathological cycles.

Keywords: cognition, enactivism, Jean Piaget, Manfred Eigen, psychopathology.

INTRODUCTION

Before we can speak of cognition, of world, or of self, we must attend to the field in which all of these appear. There is no pure point of origin; only an already unfolding encounter, a "being-in-the-world" that precedes the conceptual and grounds it (Heidegger, 1967, p. 52). Reflection is not a mirror turned inward, but an event

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that discloses a structure already at work in perception. To perceive is not to look out at a world from within a mind, but to find oneself already thrown into a sense-making process, one that gives rise to both world and self. Merleau-Ponty captures this primordial condition:

> When I begin to reflect, my reflection bears upon an unreflective experience, moreover my reflection cannot be unaware of itself as an event, and so it appears to itself in the light of a truly creative act, of a changed structure of consciousness, and yet it has to recognize, as having priority over its own operations, the world which is given to the subject because the subject is given to himself... Perception is not a science of the world, it is not even an act, a deliberate taking up of a position; it is the background from which all acts stand out, and is presupposed by them: The world is not an object such that I have in my possession the law of its making; it is the natural setting of, and field from, all my thoughts and all my explicit perceptions (Merleau-Ponty, 2012, p. xi.).

This insight forms the basis of embodied cognition and enactivism. These approaches, as a philosophy and position in the cognitive sciences, represent the idea that human experience is fundamentally that of an embodied entity, and this embodiment manifests in consciousness through "common-sense" or "ready-at-hand" knowledge. It is in the way we interact with and engage the environment that this embodiment is experienced. However, it is only through psychopathology, or disturbances in typical engagement with the world, that this embodiment is brought into explicit awareness. Phenomenology, with famous examples like Heidegger's "Carpenter and his Hammer" (Heidegger, 1967, p. 69), or Merleau-Ponty's "The Hand touching itself" (Merleau-Ponty, 2012, p. 106) illustrate that embodiment is our primary mode of being. This can be understood as embodied engagement, where cognition relies on experiences derived from having a body equipped with various sensorimotor capacities. These sensorimotor capacities exist within a broader ecological, historical, social, cultural, biological, and psychological context, known as the phenomenological life world, or being-in-the-world. Consequently, engagement implies that sensory and motor processes, perception, and action are fundamentally inseparable in lived cognition.

In contrast to the Cartesian model, which conceives perception as an internal reconstruction of a pre-given external world, the enactivist perspective understands perception as a mode of skilled engagement. Rather than extracting objective properties from the environment, the perceiver navigates a dynamic and mutable field shaped by their embodied capacities. What matters is not the representation of a static world, but the organism's sensorimotor possibilities for action. Accordingly, the reference point for understanding perception shifts: not from a world existing independently "out there," but from the structure of the perceiver's embodiment; the lived body that defines how one can act and be affected. But this embodied capacity is not self-generated. As Heidegger reminds us, we are "thrown" into a world not of our

choosing, a world that precedes us and makes itself known only gradually, through our involvements. Our being is always already situated, and this situatedness is the condition under which perception, understanding, and reflection become possible (Heidegger, 1967, p. 135). As we age and experience life, we start contemplating its nature. The world isn't a product of our making, but rather a revelation awaiting our discovery. However, it's this very world that enables us to engage in reflection. Thus, a cycle ensues: the world precedes our contemplation, yet it intertwines inseparably with our experience.

Thus, this paper aims to explore how cognition is an emergent property of the specific structure or system that our experiential structure represents. The goal is to examine how cognition arises from dynamic and reciprocal interaction with the environment, considering being-there as an organism. This dynamic and reciprocal interaction is most effectively explained through the concept of *Autopoiesis*, which refers to the self-creating and self-maintaining processes inherent in living systems. Building on this, the paper explores the potential application of concepts from enactivism and the philosophy of biology to psychopathology. The focus will be on the notion of embodied cognition and *Autopoiesis* as elucidated by Francisco Varela, contrasting it with the insights of Manfred Eigen, notably with the so called Eigen's paradox, and the cognitive philosophy of Jean Piaget. *Autopoiesis*, here is examined as a theory of mind and experience, in the sense of emphasizes the generation and utilization of experiences as information within open processes. While Eigen's insights are pertinent for understanding the transition from chemical systems to self-replicating entities, in this paper, I will argue that they might hold significance in comprehending experiential structures within the realm of psychopathology. Eigen's paradox prompts an examination of mechanisms underlying "negative constructions," highlighting their role as constructions rather than mere deconstructions of a healthy self. This discourse navigates the meaningfulness and meaninglessness of experiences as information, where the focus lies not only on information transmission but also on its initial generation.

ENACTIVISM AND EMBODIED COGNITION

The theoretical approach of embodied cognition, originally presented by Francisco Varela, Evan Thompson, and Eleanor Rosch in their 1991 work, "*The Embodied Mind: Cognitive Science and Human Experience*", represents a departure from traditional Cartesian assumptions about cognition. Embodied cognition holds that cognitive processes extend 'beyond the brain' and are fundamentally influenced by sensory and motor experiences, which in turn are shaped by the individual's interactions with their environment (Varela et al., 2017, p. xx). Embodied cognition has also

been described as the "4E" model of cognition: embodied, embedded, enacted, and extended cognition – all of which propose that cognition emerges from the interplay between the brain, the body, and the world. The intriguing aspect here lies in the fact that while the whole is comprised solely of its constituent parts, it possesses emergent characteristics that defy straightforward prediction, perhaps even in theoretical terms, based solely on the qualities of those parts in isolation. Thus, the body, *Leib*, and the environment are not viewed as separate entities, but as a unified, *Autopoietic* system through which cognition occurs (Varela et al., 2017, p. xxv). This means that the body's movements, sensations, and interactions with the environment are considered integral to the cognitive processes that take place "in the brain" and the body. In other words, cognitive processes do not take place only "in the brain" but are distributed throughout the body and the environment, *Umwelt* (von Uexküll, 1928, pp. 108-112).

Context, including social, cultural, and environmental factors, is considered crucial in shaping cognitive processes that are not limited to passive perception but involve active engagement with the environment (Varela et al., 2017, p. 174). Thus, the way a person interacts with the environment may vary depending on whether they are in a familiar or unfamiliar context. Agency, the active shaping of the environment by the individual, is a key aspect of embodied cognition that has far-reaching implications for psychopathology and philosophy. Embodied cognition essentially states that the interpenetration of enactivism and phenomenology inevitably breaks down the traditional Cartesian dichotomy between the thinking subject and the material world and challenges the privileged status of pure thought and its ability to know "objective" truths. For to truly understand the nature of human experience and cognition, one must look beyond the traditional Cartesian dichotomy between the thinking subject and the material world, as well as beyond all the reductionist and elminitavist positions that have emerged from that dichotomy. Rather, one must recognize that the body and its sensory interactions with the environment play a fundamental role in shaping our understanding of reality. In this way, embodied cognition opens new avenues for a phenomenological investigation of subjective experience, of which in the following chapters will be the focus on the cyclical nature of experiences, and experiencing as an aspect of the human being.

FRANCISCO VALERA'S CONCEPT OF *AUTOPOIESIS*

The concept of *Autopoiesis* was first proposed by Francisco Varela in collaboration with Humberto Maturana in the 1970s, predating the theoretical framework and thesis of embodied cognition developed in the 2000s, in which it is now often included. The theory arose in response to the limitations of traditional approaches

to understanding living systems, which focused on the study of the parts of an organism rather than the organism as a whole. *Autopoiesis*, or simply the theory of self-organization, proposes that living systems are characterized by a self-organizing process of continuous self-generation and self-preservation (Varela et al., 2017, p. xiv). Maturana and Varela argue that living systems are not simply passive recipients of external stimuli, but active producers of their own structure and organization. *Autopoietic* systems maintain their own identity by constantly producing and repairing their own components. It is in this sense, that living systems are self-referential, self-sustaining, and self-organizing. Valera's thesis of embodied cognition, which, as mentioned, was formulated later in a dialogue with Eleanor Rosch, Evan Thompson, and J.J. Gibson, posits *Autopoiesis* as a fundamental principle that enables an organism to interact with the environment, in the form of cycles or "feedback loops" between the organism and the environment (Varela & Maturana, 1972, p. 78). The organism itself does not have complete control over what the feedback-loops do and why or how they change; the organism cannot fully control the ways in which the feedback-loops affect its development (Varela & Maturana, 1972, p. 79-82).

Another key aspect of *Autopoiesis* is the distinction between the system and the environment, where the boundaries of a living system are not fixed or predetermined but are dynamically constructed by the system itself. The system defines its own boundaries and selectively interacts with its environment to maintain its own identity and integrity. *Autopoiesis* also underscores the importance of cognition and perception in living systems; perception is not simply the passive reception of information from the environment, but an active process of sense-making and interpretation (Gibson, 2014, pp. 121-122, 133). Living systems create their "own reality"[1] by selectively perceiving and responding to stimuli from their environment (Varela & Maturana, 1972, pp. 88-90, 93) Typically, the term *Autopoiesis* is employed to elucidate the processes within the simplest life forms, specifically cellular life forms, as it seen in the virological work of Manfred Eigen (Stegmüller, 1975, pp. 413-439).[2] As cell components are reorganized, they tend to return to their original positions in relation to other components, demonstrating a remarkable capacity for self-renewal and self-organization. The implication of this self-assembly and self-ordering is

[1] The phrase "own reality" is meant here to represent a perspectivist position rather than a relativist one.

[2] Manfred Eigen (1927–2019) was a German biophysical chemist who made significant contributions to the understanding of complex biological systems. His interests extended beyond traditional chemistry and virology, leading him to explore the fundamental question of how life originated and evolved. In the 1970s, he developed the concept of the self-organizing autocatalytic theory of life, which aimed to explain the emergence and evolution of life through principles of chemistry and *Autopiesis*. Eigen's theory emphasizes the role of dynamics and feedback loops in evolution, suggesting that early molecular systems, or "proto-cells," had the ability to catalyze their own formation, resulting in a self-sustaining cycle of replication and evolution. Over time, this process could have given rise to increasingly complex and sophisticated life forms.

that cellular structures have an inherent adaptability and responsiveness to their surrounding conditions (Varela & Maturana, 1972, p. 78) As they accommodate themselves to the environment, they display a dynamic resilience, enabling cells to sustain their functional integrity and fulfill their roles within the broader organism (Varela, 1991, pp. 79-80).

In this context of what has been said, a complex metabolic network generates its own limit, a "membrane," as an integral component of the network (Peat, 1985, p. 26). This leads to the constitution of a distinct form through an ongoing dialectical interaction between the emergent whole and the enabling network. Essentially, a metabolic network gives rise to a specific whole that, in turn, facilitates the unfolding of these processes. This involves processes that bring forth a system as a whole, while simultaneously allowing these processes to unfold (Eigen, 1971, p. 473, 490, passim.). Crucially, this is a dynamic, process-driven phenomenon, lacking static characteristics. The identity of the entity is an ongoing process, involving minute changes that sustain its unitary existence. The interplay between determinism (as described by the underlying chemical and physical principles, the Cartesian "body") and stochasticity (randomness and fluctuations, but also radical freedom) is essential for understanding how *Autopoietic* systems can emerge and evolve, regardless if we talk about biochemistry of cells or how an organized whole exists in and through its environment (Eigen, 1971, pp. 484-487). In Eigen's work on self-replicating molecular systems, the initial emergence of replicators and the subsequent evolution of life-like processes could be influenced by chance events at the molecular level: "If all processes in the universe were governed by strictly deterministic laws, we would not exist" (Stegmüller, 1975, p. 419).

Autopoiesis delves into the realm of information theory, particularly focusing on the generation and utilization of information in the context of molecular processes; in other words, "how information originates or gains value by selection" and "how selection occurs with special substances under special conditions" (Eigen, 1971, pp. 469-470). Following the example of Eigen's concept of *Autopoiesis*, which involves self-replicating entities implementing instructions from a 'genetic' plan, in this framework, information is not merely a passive carrier of data but a dynamic and fundamental component that drives the organization and functionality of molecular systems. Information theory, as applied by Eigen, goes beyond traditional cybernetics and communication theory by addressing questions related to the meaning and significance of information (Eigen, 1971, p. 467). The distinction concerning the meaningfulness and meaninglessness of information (in the sense of biosemantics) is particularly pertinent. For *Autopoiesis*, the focus is not just on the transmission of information but on the initial generation of information; the creation of a meaningful plan or set of instructions that can guide the self-organization and replication

of molecular entities. Here, Eigen's perspective underscores the importance of understanding how information, in the form of coded instructions, can arise and be processed within *Autopoietic* systems. While in the context of Eigen is relevant when exploring the transition from simple chemical systems to self-replicating entities, the meaningful generation of information in the context of psychopathology is critical.

For Eigen, the principles of evolution, particularly the contrast between the "survival of the fittest" and the intriguing perspective of the "survival of the survivors," reflect the dynamics of adaptation and persistence in organisms (Eigen, 1971, p. 430). Darwin's concept of fitness highlights traits conducive to survival, while an alternative notion emphasizes enduring qualities that contribute to long-term viability. These enduring qualities play a primary role in the interplay of segregation, selection, and, consequently, evolution within *Autopoietic* hypercycles – further demonstrating the "dual-cyclical," interactive, and dynamic nature of these systems. One cycle for self-replication (which, for Eigen, refers to nucleic acids), and another for construction (coding proteins, which are necessary for the formation of nucleic acids), with the second cycle including the construction of the first (Eigen, 1971, p. 503). These two cycles illustrate the interconnected processes necessary for the emergence and maintenance of *Autopoietic* systems – whether in Eigen's concept of life or Varela's concept of cognition and mental well-being. Just as the interplay of accidental and deterministic molecular interactions contributes to the dynamic narrative of life's origin and continuity, so too does the lived, dynamic existence of a worldly being. Their life, cognition, and sense of self emerge from a dual-cyclical interaction of assimilation and accommodation, which in turn contributes to their overall well-being. (Piaget, 2017, p. 131). Following the example, the intricate mechanism of translation, which decodes genetic information from RNA to synthesize proteins, reflects the delicate balance between accidental creation, logical necessity, chemical-physical laws, and mechanical randomness required for an *Autopoietic* system to emerge. In other words, just as life, for Eigen, emerges from and is embedded in the complex *Autopoietic* interaction between parts and wholes—between the organism and the environment – so too is cognition, for Varela, not merely a behaviorist "black box" of inputs and outputs (Skinner, 1971, p. 97), nor a Cartesian spirit pressing on the pineal gland (Descartes, 2016, p. xxii), but a necessarily embedded and enacted *Autopoietic* whole. One simply cannot isolate a part and expect to understand the whole.

The pivotal aspect is the circular process, which, rather than leading to a detrimental circularity, engenders a productive and virtuous circularity, as articulated by Varela (Varela et al., 2017, pp. 10-14, 18). It is an efficacious, formative process. While initially applied to the cellular level, Varela expanded this logic to encompass other systems. He sought to formalize this circular logic by developing mathematical

languages, ensuring its integration into formal systems without leading to paradoxes. His proposition asserted that systems such as the immune system and the nervous system exhibit the same structural organization. He referred to these as "closed systems" – not in the sense of being cut off from environmental exchange, but in that their organization is determined by internal processes (Varela et al., 2017, p. 209, 211). Organisms maintain a constant exchange with the environment through thermodynamic processes; however, in organizational or operational terms, once these systems are constituted, they function as closed systems. All internal operations transpire within the system itself, collectively upholding the system as a cohesive whole (Eigen, 1971, pp. 471-473). This encapsulates the core notion underpinning *Autopoiesis* and autonomous systems, demonstrating how circularity plays a fundamental role (Varela et al., 2017, pp. 89-91). Circular processes, as I previously mentioned, constitute the essence of biological, vital logic; the logic inherent in the workings of life. The significance of a boundary or demarcation lies in the purpose of maintaining a closed system, nestled within the broader whole. Thus, it functions to contain a complete system within itself.[3]

EIGEN'S PARADOX

Coming back to the example of Manfred Eigen [Chapter 4.1.1.], one of his contributions to *Autopoiesis* is the introduction of Eigen's paradox,[4] which offers a valuable analogy when examining psychopathology, allowing us to reveal the intricate dynamics within the *Autopoietic* relationship that underpins cognition. Much like the challenges faced in the replication of genetic information, the core of this analogy lies in the trade-offs inherent in processes vital to sustaining both life and cognitive functions. At its essence, Eigen's paradox – within the context of the philosophy of biology, molecular biology, and the origin of life – is rooted in the constraints imposed by error thresholds during genetic replication (Eigen, 1971, p. 480). The replication of genetic material, exemplified by nucleic acids, is susceptible to imperfections, leading to the introduction of errors into the new sequence. This phenomenon gives rise to mutations, both malign and benign (Eigen, 1971, p. 475). The parallel between the *Autopoietic* organization of molecular replication, and

[3] This endeavor reveals the influence of the philosophy of mathematics on enactivism.

[4] "Eigen's paradox," at its core, centers on the limitations imposed by error thresholds in molecular replication. The replication of genetic material – such as nucleic acids – is inherently prone to errors, leading to the incorporation of mutations into newly synthesized sequences. This process gives rise to mutants and establishes the concept of a quasispecies: a population of closely related genetic variants that coexist due to the high mutation rate. The paradox becomes more pronounced as the need for longer nucleotide sequences emerges to encode complex structures like proteins. However, longer sequences are more susceptible to replication errors, creating a dilemma: encoding complexity requires longer sequences, but longer sequences increase the risk of fatal mutations, potentially destabilizing the entire system.

cognition, becomes apparent when considering the need for longer sequences to encode complex structures, be it proteins or intricate cognitive frameworks such as one's self-identity and coping mechanisms. Longer sequences heighten the likelihood of errors, creating the paradox: the necessity for longer sequences to encode complexity comes with an elevated risk of introducing errors. Or as Eigen puts it: "This means that any sequence of digits will instruct its own reproduction. If an error occurs in the reproduction, the error copy will be further reproduced" (Eigen, 1971, p. 475). Akin to genetic replication, a delicate balance must be struck in the cognitive process, since, on one hand, the imperfections introduced during the formation of cognitive frameworks contribute to the generation of diversity, fostering adaptability and evolution; on the other hand, this diversity introduces the risk of distortion and the need for more specialized cognitive processes capable of integrating errors into our understanding of the world and the self through accommodation.

But how are experiences encoded and integrated? To offer a comprehensive response to this question, I turn to the insights of the French-Swiss philosopher and psychologist Jean Piaget. His contributions notably mark him as a pioneer in the development of embodied cognition as a philosophical position, and his philosophical stance closely parallels our contemporary understanding of this concept. Jean Piaget dedicated his work to understand how a child develops from an immature biological organism at birth to an adult capable of abstract reasoning. Thus, his work is of immense value, and need to be understood correctly, since the child at birth, is a pure phenomenological and enactive agent. At birth, the child possesses only a rudimentary sensorimotor system. Piaget sought to understand how this sensorimotor intelligence transforms into a sophisticated understanding of an external world—one populated with permanent objects situated in space and time – and into a self-conception as both an object among other objects and as an internal, thinking mind (Varela et al., 2017, p. 176). When discussing perception, we usually assume two primary positions. The first holds that the world possesses inherent properties, which exist independently and prior to perception. In this view, the cognitive system passively receives these properties and interprets them, whether through symbolic representations or global subsymbolic states. This position appears intuitive and often renders alternatives implausible. The second, typically cast as the only alternative, is the idealist stance: the idea that the cognitive system constructs its own reality, and the perceived external world is a projection or reflection of internal laws (Varela et al., 2017, p. 172). It is important to note that both positions emphasize representation: the former seeks to recover external reality, while the latter projects internal constructs. However, if we follow Heidegger's ontology – which serves as a foundation for Varela and Thompson (Varela et al., 2017, pp. xvii, xx) – we move beyond this dichotomy of internal versus external. Instead, cognition is explored through embodied engagement with the

world, bypassing representational frameworks entirely. As Heidegger writes: "Being-in-the-world is a totality of involvement [...] in everyday Being-in-the-world, *Dasein* is always already outside itself. It is dispersed among the equipment with which it concerns itself" (Heidegger, 1967. pp. 107-110).

In Piaget's framework, the child is neither an objectivist – where cognition is seen as the recovery of a pre-given outer world – nor an idealist – where cognition is viewed as the projection of a pre-given inner world. Rather, the infant initially knows only their own activity (Varela et al., 2017, p. 172). Even the simplest act of recognizing an object can be comprehended only in terms of this activity. From this basis, the child constructs the entire edifice of the phenomenal world, complete with its laws and logic. This process exemplifies how cognitive structures emerge from recurrent patterns of sensorimotor activity, which Piaget refers to as "circular reactions" (Varela et al., 2017, p. 176). Thus, I believe that a solution can be found in Piaget's constructivist perspective, which posits that cognitive development occurs through a series of stages, each marked by distinct cognitive structures and ways of thinking, where a interplay between accommodation and assimilation plays a pivotal role in advancing from one stage to another. The concepts of Accommodation and Assimilation are, in Piaget's framework, the fundamental mechanisms that drive cognitive development and change (Piaget, 1999, p. 42).

Accommodation refers to the process by which individuals modify their existing cognitive structures to incorporate new information or experiences; it represents a dynamic adaptation to novel experiences that do not fit within the current cognitive framework, worldview, or self-image. Through accommodation, individuals refine and adjust their mental representations to align with the complexities of the external environment they find themselves in (Piaget, 1985, p. 6). Assimilation, on the other hand, complements accommodation by incorporating new experiences into pre-existing cognitive structures (Piaget, 1999, pp. 42-43). This process involves interpreting new information in a manner consistent with existing knowledge and mental frameworks (Piaget, 1985, pp. 4-5). Assimilation thus allows individuals to make sense of the world by integrating novel experiences into familiar patterns, creating our sense of coherence, self- and world-continuity, in our cognitive schema. As individuals encounter new challenges or discrepancies in their understanding, they engage in accommodation to refine their mental structures, allowing for the assimilation of new information and progression to a more sophisticated cognitive stage. This dynamic interplay between accommodation and assimilation constitutes what Piaget termed "equilibration." Equilibration being a dynamic and iterative process through which individuals strive to maintain a balance between accommodation and assimilation. It reflects the innate human drive for cognitive harmony, as individuals

seek to reconcile new experiences with their existing understanding of the world (Piaget, 1985, p. 3).

JEAN PIAGET'S GENETIC EPISTEMOLOGY

As a genetic epistemologist, Piaget's work explores how individuals construct their understanding of the world through their unique perspectives, how knowledge structures are formed and evolve within this personalized framework (Piaget, 1970, p. 59). Genetic epistemology, as proposed by Jean Piaget, is essential in understanding the intricate systems, and processes, of creating mental images, the concept of self, knowledge frameworks,[5] object permanence, perceptions about the world and one's place in it etc., and how these images interact with each other. As stated by Piaget:

> In any possible domain of constituted thought (contrasted with the states of disequilibrium which mark its development), psychological reality consists of complex operational systems and not of isolated operations conceived as elements prior to these systems; thus, only in so far as actions or intuitive representations organize themselves in such systems do they acquire the nature of 'operations' (and they acquire it by this very fact). The essential problem of the psychology of thought is then to work out the laws of equilibrium of these systems [...] the real work of the mind seems to us to be the formulation of the laws governing these wholes as such (Piaget, 1972, p. 36).

The need for genetic epistemology arises from its unique focus on the developmental origins and evolution of cognitive and mental structures, helping us understand how individuals progress from simple sensorimotor activities to complex thought patterns, but also how they might regress or "break," over time. Piaget's perspective underscores the active agency and embodiment of individuals in shaping their "reality," showcasing a stance of perspectivism rather than relativism. Notably, in his work on *Structuralism* (1970), Piaget challenges the traditional notion that knowledge is a static fact rather than a dynamic process (Piaget 1970, p. 100). He asserts that our forms of knowledge are inherently incomplete, and our sciences are perpetually imperfect, emphasizing the need to study knowledge as an evolving process (Piaget, 1971, p. 1). Moreso, Piaget's *Psychology of Intelligence* (1972) and *Genetic epistemology* (1971), reflects the evolving perspective on knowledge, stating that, under various influences, there is a growing inclination to view knowledge more as a embodied process than a fixed state (Piaget 1972, p. 8). But how do individuals construct perspectival representations of the world, and what cognitive processes come into play during this intricate endeavor?

[5] To be understood as subjective knowledge.

According to Piaget, this cognitive endeavor involves a dynamic interplay between a state of equilibrium and its disruption – what he termed disequilibrium – which leads to a period of disintegration. This disintegration marks a transitional phase between cognitive stages, during which individuals grapple with adjusting to new and disruptive experiences (Piaget, 1972, p. 36). An individual's emotional and mental well-being is intricately connected to their cognitive processes, and various factors can disrupt this equilibrium – these carefully learned and practiced strategies – regardless of age. Personal problems, worries, or internal tensions can significantly affect daily life, often giving rise to a range of emotional responses. These responses, and their underlying causes, may not be immediately apparent through casual observation. However, it is essential to recognize that every person has limits – limits that shape how they perceive themselves, their environment, and others. For instance, the equilibrium derived from feeling loved, when lost, can result in emotions such as depression or hostility. Conversely, an excess of love – such as overprotection – may foster dependency and undermine self-confidence. On the other hand, disequilibrium occurs when one's actions in the world deviate from expected outcomes. Such deviations indicate a rift between one's mental representation of the world, the self, or the body, and the actual experiences encountered. It is a state of tension that motivates us to adjust our beliefs, our actions, or both, in order to reduce cognitive dissonance (Piaget, 1972, p. 39). Expanding on the notion of disequilibrium, Piaget's framework prompts reflection on the intricate relation between the mind and the world. Disequilibrium not only act as signals for cognitive restructuring but also reveal the complex relationship between perception and wordliness (Piaget, 1972, p. 36). The ability to confront and navigate these disruptions becomes a skill essential for adaptive learning and a more complete understanding of the complexities inherent in the construction of cognitive frameworks. Piaget's emphasis on disequilibrium as a disintegration period, but also as a transformative phase, aligns with the broader context of his work on cognitive development (Piaget, 1972, pp. 40-41). This transitional state serves as a crucible for refining not only cognitive structures but also one's self-conception, and understanding of the environment one finds themselves in.

Piaget's examination of embodied cognition also offers us a unique insight into the connection between physical, bodily experiences and abstract knowledge. Piaget contends that abstract knowledge is intricately tied to the body's structure, unfolding from the corporeal realm "upwards" into abstraction (Piaget 1972, pp. 43, 45). Essentially, all our knowledge is embodied, rooted in tangible, concrete experiences. Piaget's perspective on child development adds depth to this understanding by suggesting that a child's learning journey is not merely a cognitive process, but a fundamentally embodied one. Knowledge acquisition begins with the exploration of movement – a dynamic interaction between the child's body and the surrounding

environment (Piaget 1972, p. 49). Finally, genetic epistemology offers insights into the role of social interactions and environmental factors in the shaping of cognitive development. As individuals engage with the world, their self-image and perceptions of the world are not formed in isolation but are profoundly influenced by the dynamic interplay between inherent cognitive structures and experiences (Piaget 2017, p. 254). Thus, what sets Piaget's viewpoint apart is his emphasis on the social dimension within embodied cognition; the presence of other people, he argues, profoundly influences the [child's] cognitive landscape (Piaget 1972, pp. 123-124, 156-159).

Building on Piaget's insights, contemporary discussions on embodied cognition underscore the inseparable link between the mind and the body. The body is not a mere vessel for abstract thoughts; it actively participates in knowledge construction.

> Reality is perpetually being "assimilated" by the motor schemas of the organism, without it being possible for consciousness to take part in this assimilation. Assimilation is therefore not an induction. It is the expression of the complete continuity which binds the organism to its biological environment. It is prior to any distinction between the external world and the ego [self] (Piaget 1972, p. 131)

For example, in the context of childhood development, the acquisition of motor skills assumes a pivotal role. As a child undergoes the process of learning how to move, the intricate development of procedural memory becomes apparent, intricately influenced by the surrounding social environment. In a child's developmental process, according to Piaget, the acquisition of motor skills plays a pivotal role and is intricately connected to the development of procedural memory. This procedural memory – vital for executing various actions – is significantly shaped by the pervasive influence of social interactions and the presence of others (Piaget, 2002, pp. 58-59). The fundamental premise lies in the incorporation of the implicit knowledge of "knowing how to act" into one's behavioral *repertoire*. Embedded within our behavioral responses is a learned manifestation of the social structure from which we have emerged. The ability to discern and understand one's actions becomes a mechanism through which social rules are extracted, revealing the interplay between individual behavior and societal norms. It is not a conscious awareness of these rules, but rather an implicit integration of social norms into the very fabric of individual conduct (Piaget, 1970, pp. 79, 103). The detection of societal norms often occurs when they are transgressed, underscoring the implicit nature of their integration into individual behavior. Much like Heidegger's famous example of the carpenter's "hammer *hammering*" and the "hammer breaking" (Heidegger, 1967, pp. 69-71) the awareness of societal norms is heightened when they deviate from the expected course. The origin of these norms lies in the intrinsic structure of individuals and the consequences of learning within a social environment. The developmental trajectory involves not only the internalization of norms but also the nuanced realization that

these norms, though external, come to manifest in our behavior as if they were inherently personal. This paradoxical interplay allows for the state of inauthenticity, where individuals act in accordance with norms that, despite being foreign, are assimilated and enacted *as if they are* an inherent part of their identity.

Psychopathology here emerges as the asymptotic limit of human behavior under the breakdown of societal norms.[6] This breakdown unveils socially unacceptable experiences that transcend the veneer of interpersonal constituted reality, revealing the inherent fractures in the perception of our shared existence. The recognition of these unsettling experiences propels the individual toward a state of equilibrium, albeit one fraught with societal dissonance and divergence from conventional norms. Piaget offers a complementary perspective on the integration of societal norms, contending that our inclination to assimilate and adhere to such norms is rooted in the inherent tendency of our initial representations to veer away from complexity. He posits that individuals find comfort and familiarity in the simplicity of their surroundings. Consequently, everyday life is predominantly navigated through partial representations – knowledge structures that are inherently incomplete.

The notion of maintaining social identity becomes a critical aspect within this socio-cognitive framework. Individuals, operating with partial and often fragmented representations, are themselves inherently incomplete – yet they project a sense of assurance and understanding through their actions. This inclination to present a composed and coherent social identity reflects the complex interplay between individual self-representation and societal expectations. Individuals establish a set of expectations and desires regarding the unfolding of their world. This process unfolds within a social context, emphasizing the shared nature of expectations embedded in societal norms. The alignment between actions and societal expectations fosters a sense of being "at home" – a state of emotional regulation and comfort. As long as this alignment persists, individuals experience a sense of familiarity and emotional stability within their social milieu. This dual interplay between the inherent incompleteness of individual knowledge, the influence of societal norms, and the alignment of individual actions with social expectations creates a dynamic socio-cognitive landscape. In the event of discrepancies between our actions and the expected outcomes based on our understanding, Piaget introduces a perspective centered on the generation of a multiplicity of potential environments. Piaget's proposition

[6] The definition of psychopathologies invariably hinges upon categorizing them as "behaviors outside of societal norms," due to the inability to peer into ones experiental structure. This limitation serves as the fundamental boundary for substantiating the "illness" aspect of mental health. While there is some acknowledgment of contributing factors such as organic or chemical systems, psychopathology has traditionally avoided a comprehensive exploration of these complexities. A similar skepticism surrounds research involving neuroscience and brain imaging, making it difficult to envision a trajectory that moves beyond treatment models focused primarily on behavioral interventions.

underscores the cognitive response to incongruities in our interactions with the world. When faced with disruptions, individuals engage in a mental process wherein a range of potential environments, akin to avatars, is generated. This multiplicity of potential environments reflects a cognitive strategy to navigate uncertainties and adapt to varying circumstances (Piaget, 2017, pp. 130, 240). Failure to envisage oneself in future scenarios leads to anxiety, a sentiment germane to a Piagetian exploration of psychopathology. The inability to envision one's existence in future contexts disrupts temporal continuity, engendering a state of existential unease. Anxiety emerges as a significant manifestation of maladaptive cognitive processes and disruptions in temporal continuity.

CONCLUSION

Assimilation, within the context of Piaget's framework, can be understood analogous to the "encoding" of new information into existing cognitive structures, as with the autocatalytic replication process of Eigen's theory, where novelty is assimilated into a pre-existing sequence. Here, a paradox arises when considering that, despite the inherent instability introduced by constant accommodation to novel experience, it is precisely this adaptive instability that is required to regain stability and resilience of the cognitive system. Eigen's paradox thus sheds light on the inherent tension between cognitive stability and change in cognitive development. The paradoxical nature arises from the simultaneous need for cognitive stability – achieved through assimilation, and cognitive adaptability – achieved through accommodation. The interdependence of these processes mirrors the delicate balance Eigen observed in biological systems, emphasizing the dual role of instability and stability in fostering developmental progression.

Psychopathology, in short, can thus be understood as a refusal to accommodate assimilated information (Piaget, 1985, p. 14). For example, the psychopathology of coping mechanisms delves into the ways individuals navigate and respond to stressors, adversity, and challenging circumstances (Humpston & Broome, 2016, p. 255). Coping strategies, which are essential for psychological well-being, can exhibit maladaptive patterns such as isolation, avoidance, denial, or reliance on harmful behaviors as a means of managing stress, contributing thus to psychopathological manifestations (Castellini, 2016, p. 86). The therapeutic implications of Eigen's paradox in this context of Piagetian concepts are also noteworthy – interventions targeting psychopathology often aim to disrupt this cyclic process by modifying maladaptive cognitive patterns (accommodation) while facilitating the assimilation of healthier cognitive processes. Moreover, excessive or inappropriate coping mechanisms can disrupt normal functioning, exacerbating mental health challenges.

While the construction of coping mechanisms is a common human response to navigate stress and adversity, it is a vicious cycle, a self-perpetuating feedback loop that exacerbates psychological challenges. When individuals employ coping mechanisms that are not inherently healthy or sustainable, there is a risk of entering a cycle where the temporary relief provided by these strategies is short-lived. As the underlying stressors persist or intensify, individuals may resort to increasingly challenging coping mechanisms, leading to a continuous and escalating pattern. This cycle can eventually contribute to a breakdown in mental well-being, as the coping mechanisms themselves can be the sources of additional stress and strain, culminating in a collapse of adaptive functioning (Bertelli et al., 2019, pp. 1315-1317). In other words, the parallel between Eigen's paradox and cognitive development becomes clear when we understand that *Autopoiesis,* a concept describing self-maintaining systems, applies to various levels exhibiting similar reciprocal and membranous or boundary-maintaining mechanisms. The paradoxical element lies in the fact that building mental resilience requires exposure to mentally challenging events and situations. According to Piaget's pedagogic principles, an isolated child, though protected from the chaos and unknown dangers of the environment, remains vulnerable. To cultivate mental resilience, exposure to risk is necessary. A child needs to scrape their knee to learn that the pain is bearable. However, if the lessons learned are flawed, those errors will be perpetuated. Factors such as an entitled sense of self-worth, a spoiled upbringing, or a lack of love can significantly influence how future events and situations are encountered and managed.

By constructing elaborate and fantastical beliefs, individuals may seek to create a sense of stability and control in an otherwise overwhelming and chaotic world. The escalating nature of delusions, as described by Piagetian assimilation and accommodation, can be interpreted as a further manifestation of this escapist tendency. As delusions become more elaborate and convoluted, they provide an increasingly impenetrable shield from the discomforts of unaccommodated phenomena. The fragility of grandiose delusions, as highlighted by Eigen's paradox, suggests that this escapist strategy is inherently unsustainable. The more elaborate the delusion, the more fragile it becomes, as it becomes increasingly difficult to reconcile with reality. An individual afflicted with disorders such as Obsessive-Compulsive Disorder (OCD) or Body Dysmorphic Disorder (BDD) assimilates anxieties or fears into their daily experiences (Ahern et al., 2019, pp. 710–714). In OCD, accommodation often takes the form of compulsive rituals. For example, someone with contamination fears may continually assimilate the notion of impurity in their surroundings, leading to ritualistic handwashing or avoidance behaviors as a form of accommodation (Fuchs, 2019, pp. 534-535). Similarly, individuals with BDD assimilate perceived flaws in their appearance into a wide range of situations, interpreting external stimuli

through the lens of their body image concerns (Castellini & Ricca, 2016, p. 861-865). Accommodation in this context may involve engaging in compulsive grooming or seeking excessive reassurance about their appearance (Castellini & Ricca, 2016, p. 870). When it comes to Eigen, consider a person who experiences a single negative event – such as a minor failure or rejection – and, as a result, develops a simple negative thought: "I'm not good enough." Over time, this initial thought may replicate and evolve within the individual's mind, giving rise to a complex network of negative beliefs about the self, one's capabilities, and the future. This progression can ultimately contribute to the development of a depressive disorder. In this context, Eigen's paradox invites us to reflect on how a seemingly simple negative cognition can evolve into a complex, self-sustaining pattern of depressive thinking – mirroring the paradoxical challenge in biology where increasing informational complexity demands fidelity in replication, even as replication remains prone to error.

Similarly, consider a person who has a simple fear response to a specific situation, like speaking in public, eating in front of others, etc. This fear response could, over time, replicate and generalize to other situations, leading to a complex pattern of anxiety that affects multiple areas of the person's life. Here yet again, Eigen's paradox, as understood through the concepts of Accommodation and Assimilation, might help us understand how a simple fear response can evolve into a generalized anxiety disorder. Central to mental well-being is an accurate self-concept – one in which an individual possesses a genuine understanding of themselves. A distortion in this self-image – as seen in conditions like Body Dysmorphic Disorder (BDD), where one perceives themselves as significantly inferior or, in some cases, superior to reality – can lead to maladaptive behaviors. These may include social withdrawal or attempts to reinforce the distorted self-image, whether through exaggerated displays of confidence or through self-destructive actions (Castellini & Ricca, 2016, p. 869).

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Od smislenih uputa do naučene bolesti: filozofske perspektive psihopatologije i dinamike informacija

SAŽETAK

Rad istražuje ravnotežu između mentalne stabilnosti i prilagodljivosti u kognitivnom razvoju, posebno kroz enaktivističku prizmu, uglavnom kroz Piagetove koncepte asimilacije i akomodacije i Eigenov koncept samoorganizacije. Središnja ideja je da dok je stabilnost neophodna za kognitivnu otpornost, prilagodljivost je neophodna za rukovanje novim

iskustvima. Psihopatologija se ispituje kao poremećaj te ravnoteže, gdje neprilagodljivi mehanizmi suočavanja sprječavaju akomodaciju, jačajući negativne mentalne obrasce. Raspravlja se o poremećajima kao što su OKP, BDD i anksioznost kako bi se pokazalo kako strahovi ili negativna uvjerenja mogu postati samoodrživi ciklusi, što dovodi do ukorijenjenih neprilagodljivih ponašanja. U tekstu se također naglašava da je točna predodžba o sebi ključna za mentalno zdravlje, jer iskrivljena percepcija sebe može potaknuti psihopatološke cikluse.

Ključne riječi: enaktivizam, Jean Piaget, kognicija, Manfred Eigen, psihopatologija.