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Cognitive Science Meets Nosotrificación: A New Frontier in Diagnostics

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Introduction

This proposal supports the concept of 'nosotrificación' and emphasizes the significance of establishing a relational foundation in the diagnostic process. Moving away from the dominance of biomedical and biopsychosocial models is crucial, especially in the intricate realm of the diagnostic process. The relation between clinician and patient, marked by complexity, necessitates adaptable and person-centered approaches.

In the context of the diagnostic process, the convergence of health and healthcare goes beyond academic definitions, navigating through cultural nuances across diverse communities. Healthcare professionals need to go beyond mere diagnosis and treatment, striving to understand how patients perceive health and the diagnostic process to guide them towards optimal well-being. While the traditional biomedical model viewed patients through individual diagnoses and treatments, Engel's biopsychosocial model recognized the importance of psychological and social factors alongside biological variables (Engel, et al. [1]). Despite these advancements, challenges persist in optimizing the clinician-patient relationship in the diagnostic process. This paper explores different knowledge paradigms, with a specific emphasis on the relational aspect, focusing on their applicability to the diagnostic process. Through an exploration of cognitive science and relational theories, the goal is to propose a model that not only integrates these theoretical frameworks but also aligns with the communication dynamics and shared processes crucial in the diagnostic process. The ultimate objective is to champion a more comprehensive and patient-centered approach within the diagnostic process. The purpose of this paper is to review various knowledge paradigms, with a spotlight on the relational one, aiming to propose a model that incorporates aspects of cognitive science and is grounded in communication and the development of shared processes in the clinical-patient relation.

The Symbolic School

In principle, we could say that the roots of the Cognitive Sciences lie in its early days in the so- called Cybernetic Science, specifically between 1934 and 1943. The manifest intention of the cybernetic movement was to create a science of the mind, for this it was aspired to express that the phenomena of the mind were modelable as explicit mechanisms and mathematical formalisms. What is important as a field of knowledge is McCulloch's legacy which consists in the integration of the philosophical, the empirical and the mathematical. The Cognitive Sciences take their name from the process of change between an experimental approach and the leap to comprehensive research program. Just as the cybernetic phase emerged in 1943, Cog-

nitivism itself was born in 1956, becoming very influential from 1970 onwards. The central idea of cognitivism was that knowing is similar to computing insofar as it is a computation on symbols that represent what they designate. As Varela points out, the idea is one of representation or intentionality. The problem lies in how to correlate the representational attributes with the physical changes that the patient undergoes, in our case, when acting. For the Cognitivist or symbolic school, cognition is the processing of information as symbolic computation or manipulation of symbols based on rules.

For this school, symbols must appropriately represent an aspect of the real world (Rabossi, et al. [2]). That aspect is not precisely the patient, but the clinician's distinctions from the signs and symptoms of the disease. In this way, the clinician interacts with the form of the symbols (their physical attributes) which implies a dissociated representation of the patient. But it is not just any representation, but one in which the clinician, by processing his symbols, arrives at an adequate solution to the problem posed, which is what his representation implies. In the epistemological framework, we could classify this approach within naive and critical realism (Lavanderos, et al. [3]) since, in naive realism, the mind adopts a passive attitude towards the knowledge of the exterior, which would be a kind of tracing or photocopy of it. Critical realism, on the other hand, grants a certain active role to the mind in the process of knowing.

The Connectionist School

A second approach to Cognition arises from the notion of emergent properties and self-organization. Two shortcomings of the symbolic school make the latter central. The first refers to symbol processing being based on sequential rules, applied one at a time. If the processing involves many sequential operations, this architecture becomes a serious limitation. In the clinical case, if signs and symptoms are beyond the professional's competence, he/she must refer the case to another. The second preaches that symbolic processing is localized: any dysfunction of the rules of the system or of any part of the symbols leads to a serious systemic dysfunction, which implies that the diagnosis is at risk if it does not comply with the rules for which it was designed. Conversely, a distributed operation makes the systemic organization more immune to dysfunction. This is what we would call a systemic clinical conception. From the above, the cognitive construction is made from the connections between simple units. In our case, signs and symptoms configure the diagnosis from their history of connections, making the diagnosis dependent on the history of connectivity, therefore, the connectivity of the diagnosis becomes inseparable from its history of transformations and is related to the kind of task defined for it, Varela, et al. [4]. Since the orientation in the reformulation of cognition is on connections, this approach was called Connectionism. In this case, the strategy consists not in symbols and rules but in the connective dynamics between elements, where each of these operates only in its local sphere.

As the system is constituted by a network, there is global cooperation, which emerges spontaneously when a mutually satisfactory state is reached by the components. From this school, clinical diagnosis is the emergence of global states in a network of signs and symptoms, whose validation is given in the relationship of correspondence between the emerging states (clinical patterns) and the resulting structure or diagnosis for a given cognitive aptitude of the clinician, where the important thing is the disappearance of the representations as an idea of reduction of reality. The system constructs its own world, and its coherence only reflects the internal laws of the diagnostic process. However, this same position leads us, in the case of the patient-clinician unit, to the need to consider its disjunction, since self-reference cannot be closed to self-organization as a process. To overcome this problem, the solution lies in making the patient operate in a closed way, but in relation to a pre-given world of meanings, where the disjunctive process is still evident. If we describe the patient as an autopoietic system, we are assuming that all its operations are closed with respect to the health professional, where the underlying assumption is the existence of structural determinism, which would ensure the closed character of the patient's operations. The immediate question then is how the patient relates to the clinician without the clinician determining changes in his organization? This answer is found i n the concept of structural coupling proposed by Maturana y Varela, et al. [4], which would explain that the patient possesses data that are not relationally information for the clinician, thus, he would ignore within his network of operations this type of differences. So how do the operationally closed operations of distinction account for these, how do we know what the boundaries of our self-referentiality are? If the clinician does not specify changes in the system, at least it must be presupposed, otherwise autopoiesis stops and the system disappears. This means that the patient is adapted to the communicational space of the clinical diagnosis.

The Enactiv School

The enactive school proposes that cognitive skills are linked to a lived history, where cognition ceases to be a device that solves through representations to make a world emerge through effective action: history of structural coupling that enacts (makes emerge) a world, Varela, et al. [4]. Thus, Varela classifies the two previous schools as forms of cognitive realism, on the basis that for them the world can be divided into regions of discrete elements and tasks, where problem solving is constitutive to cognition, and its success will depend on respecting properties and relations of these pre-given regions. The problem is that these assumptions only work when the clinical diagnosis assumes that all disease states are possible to specify. However, if they lived world has no predefined boundaries, since it boasts variety, it seems unrealistic to try to capture clinical experience as a representation. From the above, the question arises: Can we construct a way that contemplates cognition as the recovery of a pre-given external world (realism) and at the same time as the

projection of a pre- given internal world (idealism)? For Varela the solution passes through the concept of embodied action, where he establishes a dependence of cognition in relation to the possession of a body with diverse sensory-motor aptitudes, embedded in a broader biological, psychological, and cultural context, w h e reaction emphasizes the sensory-motor processes, and makes them inseparable from perception in lived cognition.

The central idea of enaction is "to determine the common principles of legal binding between sensory and motor systems that explain how action", Varela, et al. [4]. For enaction, living systems meet three conditions: richness in self-organizing aptitudes, a mode. of structural coupling that allows the "satisfaction" of viable trajectories, and the modular character of sub-networks of independent processes that interact and modify each other. Taking Varela's idea of enaction a step further, but changing the level of complexity, in the domain of the clinician-patient relationship, the basic point is that the clinician is not independent and pre- given and cannot be separated from what the patients are and do. Hence, the clinician and the patient relate to each other through mutual specification or co-determination. The regularities of symptomatology are the result of a joint history, a congruence born of a long history of couplings. Within this proposal, which we consider to be the major effort to achieve a relational reformulation of the clinician-patient systems, however, the culture of disjunction creeps in. This disjunction is established in acting or putting into action (enaction, from the English to enact), where on the other hand the idea of the pre-given is not overcome by the fact of betting on structural coupling. The enactment implies the existence of at least two structures, so that the history of structural coupling that enacts is possible, where clinician and patient cannot be expressed or understood as histories of coupling, and strictly speaking, in this context, culture is a configuration of distinctions of conservative character that operates in a closed network for that configuration.

On the other hand, it does not overcome the Cartesian duality mainly because, although the enactant is co-determined, its enunciations from the operation of distinction or diagnosis will emerge by identity (belonging) or by opposition (differences) in relation to the coupled. We refer to identity whenever a unit or structure is a member: structure within another structure, and to opposition whenever the unit is a class: structure coupled or uncoupled to another structure. In short, the reformulative process follows the regular path of Cartesianism, i.e., starting from split units to arrive at totalities, never starting from totalities to arrive at totalities. This is ultimately the problem, the representations of the pre-given or the projected internal states are always of units that need to be "co-something". Overcoming the disjunction is then the next step, where the clinical-patient unit is a relationship, and therefore its dynamics and its reformulation are from the relationship, a totality.

The Relational School

Relational theory was born as a way of explaining the process of knowledge, knowing, through a process of triferentiation that allows us to generate distinctions, form and meaning, from a set of ideas, such as what we do not see, but we know is there. Triferentiation is the extraction of differences from a triad where at least one component can centralize the differences extracted. We can give names to the relation, but still the name, or the name of names is not the name, and the name of the relation is not the relation. If we say that the relation between something and another something is of the kind, we denote by saying that the first something is the name of the second something. Thus, in a space of signification, the distinction that arises from the triference makes us think of three relations that generate it, among which there is always the observer or at least a centralizing unit of information. From the framework of relational theory, relational cybernetics emerges as the science that studies relational viability as ecopoiesis, defined as the strategy of reproduction of an organism- entorno relational unit, and is considered from this point of view as a reference system that privileges the observer-entorno relationship as a process of territoriality construction (Lavanderos, et a. [5,6], Hormazabal et al. 2021).

The territoriality that emerges as a process of effective equivalence in the exchange of maps or landscapes (configurations of meaning) from the activity generated in the entorno of observers in communication brings with it the effectiveness that emerges in the affective domain, so that the diagnosis is an emergent process of relational configurations that are generated from the triferentiation of an observer within his entorno that only has meaning for him (Malpartida, et al. [7-9]). This meaning is what makes it possible to agenticate territoriality patterns or, in other words, to generate identity from agency (making something our own) and belonging (becoming part of). From this process, the territoriality of the diagnosis, as a collective idea, is co-constructed among the observers who constitute the clinical-patient relationship, and consequently, the descriptions and interpretations are determined through communication processes constitutive of that relationship, which we will define as the generation of configurations of territoriality or, for this case, clinical diagnosis. In this view, clinical diagnosis is not experiencible as a diagnostic object independent of the relationship, but as the strategy of selecting alternatives of descriptive elements that emerges as a constitutive property of the clinical-patient observational relationship (Abel, et al. [10-15]). In this perspective, the descriptive- interpretative process is not applied to a patient but is a process of co-circumstantiality in the distinction of triferences, since it involves both the definition of the clinician and the definition of the patient.

We could expand here, that the health professional is constituted in the act of distinction as a unit (Maturana y Varela,2002), being the centralizer of the relationship with what is observed and therefore a participant in it (Maturana, et al. [16-19]). From the relational school, we could summarize the cognitive process of clinical diagnosis as the generation of configurations of distinctions, in relation to the meaning of their exchange, product of the clinical-patient relationship. The

territoriality of the observer is evidenced from his discriminative-affective operation (distinction), in relation to the unit of observation, which by some criterion cuts a sequence and exposes it acting based on some meaning that must be explained. Because of the possibility of describing, which arises from our history of descriptions, from our culture, we must recognize ourselves as part of the observation system involved in the communicational plot. From this perspective, the configuration of clinical diagnosis is co- constructed from our distinctions, as a clinical-patient relational process. In this context, clinical diagnosis as an organized form of distinctions is not only constructed from certain criteria that need to be made explicit, but also responds to a strategy and necessarily to a cognitive style (Mayurama, et al. [20]). On the other hand, within these criteria, communication between observers, for whom messages have a meaning that is determined by the history of previous relationships and communications, is of vital importance. Classifications, hierarchies, and finally, the organization of the clinical, emerge as part of the process of preserving the patient-clinician relationship, i.e., they are not "applied to that something called patient".

Discussion

Cognitive is a significant example of the polysemy in health as a source of terminological confusion, whose use has been appropriate for cognitive science, cognitive neurosciences, cognitive psychology and cognitive neuropsychology. Our knowing, interpreting and/or understanding the world around us is part of our ability to relate knowledge and experience, generating our cognitive reserve, the origin of which was used in philosophy of science to describe propositions that could be interpreted as true or false ("cognitive significance") (Green, et al. [21]). In the field of "cognitive science" its beginnings go back to milestones such as Norbert Weiner's cybernetic theory formula, Claude Shannon's information theory and Karl Lashley's brain mechanisms of behavior, (Gardner, et al. [22]). In the medical field, the cognitive in its beginnings, is linked to memory and in relation to what was called "cognitive paradigm" Berrios, et al. [23], leading to the "cognitive revolution" of the 60s, and giving rise to cognitive neuroscience a decade later (Berrios, et al. [23,24]), Since then, the "cognitive", has experienced a use that has been expanded to describe the new disciplines related to this field. In the different cognitive positions, if we consider that the cognitive conception in relation to the clinical-patient relational unit is predicated, external or representable (symbolism and connectionism), then the clinician, a professional of any health discipline, can be considered heteronomic in relation to the patient and his circumstances. This implies schemes of action that consider the history of the patient independent of the history of the clinician who makes the distinctions of his or her history.

This is susceptible of being characterized as a perspective comprising clinician and patient, where the "and" makes explicit the disjunction between the two. The consequences of this are that classifications, hierarchies and models of health care and clinical diagnosis are applied to the patient because they are understood as separate entities. On the other hand, if we consider that the possibility of describing is based on our history of distinctions, that is, recognizing ourselves as part of the observation system involved in the communicational plot, then the relationship with the patient is the result of syndromic regularities, (set of signs and symptoms) as a joint history, a co-construction between the actors of that plot, based on their distinctions, as a clinical-patient relational process in a congruence that is born of a long history of couplings. Given the above, the clinician-patient relationship can be considered as an enactive system only if both have shaped a history of co-determined structural coupling. As an alternative to this scheme, the process of territoriality of clinical diagnosis emerges as an effective equivalence in the exchange of maps or landscapes (configurations of meaning), based on the activity generated in communicating observers. Effectiveness emerges in the affective domain in the process of differentiation by agency and belonging. In this relational perspective there is no structural coupling; in this perspective, classifications, hierarchies and finally clinical diagnosis emerge as part of the relational process of the clinical-patient relationship, i.e. "they are not applied to something". Thus, the relational unit and its configuration are a process, which, as such, changes continuously in the maintenance of its organization.

The above perspective has "cogno-political" consequences, i.e., forms of knowledge that must beinstalled in the training of health professionals. Thus, the hegemony of the biomedical model and even more of the biopsychosocial model, which symbolize a predominantly political discourse, camouflaged by making the practice of health care appear as neutral, generating an insurmountable purpose, impossible to be questioned, such as healing, must be overcome. Our proposal is to transit to "nosotrification", from the Jewish Christian "I" to the "We" of the concept of living well (Sumak Kaway) (Lavanderos, et al. [5]), it is in this sense that the clinical-patient relationship must be inserted in daily practice, as constitutive of complex viable systems such as the family and the community. This relational basis is only possible by learning from the epistemologies of non-representation, whose basis allows to make viable the complexity of life in general and human life. In conclusion, the proposal to move towards 'nosotrificación' and to consider a relational basis in primary care emerges as an essential way to optimise clinical practice. Overcoming the hegemony of biomedical and biopsychosocial models is crucial in this setting, where the complexity of the doctor-patient relationship requires more flexible and person-centred approaches. The construction of clinical diagnoses as emergent processes of relational configurations becomes particularly relevant in primary care. Attention to cultural diversity, a deep understanding of how communities conceptualise health, and a focus on effective communication with patients are indispensable pillars of quality primary care. Ultimately, these conclusions suggest a paradigm shift in the training of primary care professionals, where empathy and contextual understanding are as important as clinical skills. Integrating this approach into primary care not only improves

the quality of care, but also strengthens the doctor-patient relationship, laying the foundations for a more holistic and effective healthcare system.

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