CHAPTER 1

Towards a protyposis-based semiotic theory of translation

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This contribution presents a semiotic theory of translation based on protyposis that bridges the gap between quantum physics, semiotics, and translation studies. Protyposis, an elementary quantum structure, underlies all possibilities for generating meaningful information. The theory critiques traditional notions of information and examines its development from the communication theory of Shannon and Weaver to more complex biosemiotic perspectives. It addresses the interplay between protyposis and semiotic processes and shows how meaning emerges from relationships and functions that go beyond the quantum level. It integrates Marais' work on semiotic translation theory, which proposes translation as a negentropic semiotic process that works within constraints to create relations. The study culminates in the advocacy of a transdisciplinary approach underpinned by protyposis to comprehensively understand the complexity of translation and information processes, opening a new perspective for understanding communication, perception and knowledge construction in different scientific fields.

Keywords: information, qubits, protyposis, semiotics, biosemiotics, information theory, translation, translation studies, transdisciplinarity, negentropy

Introduction

The importance of the term protyposis arises from the need to overcome the common misunderstanding generated by the concept of information. The latter poses a problem in that it is related to meaning and knowledge, as well as the paradoxical nature of information (Cannizzaro 2009; 2013, 106; 2016; Schumacher, 2015, 4–15); that is, on the one hand, information can be a complex physical "something" such as a sound; on the other hand, it can be an abstract "something", such as a message. To this end, some fundamental concepts related to information are

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message, symbol and code. Not surprisingly, all of these concepts, like information itself, are controversial and have been put to various uses.

The fundamental problem with information in biosemiotics lies in the need for more consensus on its relation to semiosis (Cannizzaro 2013, 105–7). While some scholars emphasise the meaninglessness of information (Brier 2015; Brier and Joslyn 2013a; Sharov 2010; Sharov and Tønnessen 2021) and contrast it with semiosis, others suggest a close relationship between the two (Hoffmeyer 1996, 2008; Kull et al. 2009; Marais and Kull 2016). In addition, there is the lingering question about the best way to unify information theory and semiotics. Although a definitive conclusion has yet to be reached, several viable solutions have been proposed. Some, for instance, support a unified definition of information through a biosemiotic perspective, because the interaction of living systems with their environment is intrinsically linked to sign relations and information exchange (Rubin 2017). Others suggest unifying information theory and semiotics, exploring convergences, and establishing correlations between the two disciplines (Brier and Joslyn 2013b; Kull et al. 2009; Matsuno 2013; Queiroz, Emmeche and El-Hani 2005). Ultimately, biosemiotics offers an interdisciplinary framework for addressing the problem of information and its relation to living systems, hence, encouraging research and dialogue between different scientific fields (Barbieri 2013; Battail 2013; Pattee 2013; Vitti-Rodrigues and Emmeche 2017, 2021).

Yet another problem with information in the context of biosemiotics is its divergent evolution and approaches, throughout history, by researchers representing different fields of knowledge. Initially, information was conceptualised in Shannon and Weaver's communication theory, which focuses on the efficient transmission of signals and is defined as "information is a measure of one's freedom of choice when one selects a message" (Shannon and Weaver 1949, 9). Their conception was based on a linear model of communication and the reduction of entropy at the source of information. The success of this theory lies in its explanatory power. Indeed, the mathematical term information has nothing to do with the value, meaning, or sense of a message. The communicative process is independent of the content of the message. According to Shannon, "information is the ability to distinguish reliably among possible alternatives", that is, each message communicated is an alternative to a set of possible messages, between yes or no, between 0 or 1, or between open or closed. This type of binary value message is known as a binary digit (bit). Bits allow information to be transformed into other types of information, such as numbers, letters, or images. Bits can be stored as data, but they can also represent computer programs, that is, a set of instructions that instruct the computer how to operate. These programs can be stored as simple files, or their instructions can be executed (Schumacher 2015, 7–9).

However, as second-order cybernetics advances, the concept of information takes on a less formal and more subjective perspective. Authors such as Gregory Bateson and Heinz von Foerster introduce the notion that information is "a difference which makes a difference" (Bateson 1967, 458–9) and that it only exists in relation to an observer or system that perceives it as relevant. Bateson argues that a potential fact becomes a fact only when perceived as relevant to a living organism (El-Hani and Queiroz 2007). This implies that information does not exist in isolation, but is constructed by the observer during the observation of the system.

With the above in mind, the idea of information with technology takes shape, and the very same concept applies to the biosphere and the natural world. Here, the evolution of the concept of information in biosemiotics poses an epistemological problem (Pattee 2013; von Uexküll 1982, 2014; Wilden 1980). On the one hand, information is viewed as an objective and necessary entity, rooted in thermodynamic entropy and described formally and quantitatively. On the other hand, there is a view of information as a subjective and relative entity constructed by the observer and dependent on context and relevance (Hoffmeyer 2008; Kull et al. 2009; Sebeok and Danesi 2000).

One has reason to wonder whether it is possible to use information in such a way in the interest of explanatory value for the natural sciences. After all, what characteristics should "information" have to be objective? Here, the problem with the term information lies in its close association with meaning, which poses challenges in the focus of the natural sciences on identifying the structures and processes occurring within and between these structures in reality (Görnitz 2019, 2–4; Görnitz and Görnitz 2006; 2016, 10). However, as a subjective aspect, meaning cannot be considered an object of study in, for example, physics.

Biosemiotics addresses information processes, meaning, and function in living beings, by addressing an interdisciplinary perspective (Hoffmeyer 1996; Kull et al. 2009). This approach integrates with the theory of protyposis, by allowing for a broader and more complex understanding of the interaction between information, life, and culture. Moreover, biosemiotics is seen as a new interdisciplinary project that recognises that life is based on semiotic processes, that is, the generation and communication of meaning through signs and symbols. By addressing the fundamental problem of information science in the biological context, biosemiotics contributes to a more complete and enriching view of life and its relationship to information and meaning.

Clearly, interdisciplinarity in biosemiotics is an approach that seeks to transcend traditional disciplinary boundaries and encourage collaboration between different scientific fields. It recognises that understanding living systems and their relationship to semiotic processes requires a holistic approach that integrates knowledge and methods from various disciplines, such as biology, semiotics, ecol-

ogy, cybernetics, and other related areas. Hoffmeyer stresses the importance of adopting an interdisciplinary perspective to understanding life as a phenomenon that is deeply rooted in meaning-making processes and information exchange (Hoffmeyer 1996, 2008).

However, there are also criticisms and challenges associated with interdisciplinarity in biosemiotics. Some scholars argue that integrating different disciplines may lead to a loss of methodological and theoretical rigour, as each discipline has its epistemological standards and approaches (Barbieri 2013; Pattee 2013). Furthermore, differences in the concepts and theoretical frameworks used by different fields can hinder effective communication and interdisciplinary collaboration.

The framework I propose is guided by principles that expand semiotic translation theory. I will emphasise the necessity of encompassing all disciplines involved in studying translation. While Marais and Kull (2016) have initiated an interdisciplinary dialogue between translation and biosemiotics, further progress is required to enable each independent domain to contribute to its unique field of knowledge. However, this approach should also foster interactions and interrelationships among these disciplines, in order to develop a transdiscipline (Basarab 1996; Morin 1978, 1998).

At the intersection of biosemiotics, information theory and translation theory, the concept of information poses a challenge across the disciplines. To seek a unifying and integrating element in the theory of possibility, I propose adopting the concept of protyposis from quantum physics as a foundational element (Görnitz 2005, 2019; Görnitz and Görnitz 2006, 2008, 2016). Protyposis encompasses all the potentialities of generating meaningful information, by serving as a bridge between these fields. Protyposis and translation share a common characteristic: they are semiotic processes that involve the creation of meaning. Protyposis acts as the elementary structure that underlies the manifestation of information with meaning. Recognising that meaning cannot arise from nothing, the essence of significance is inherent in protyposis. Therefore, I propose that translation serves as a complex factor based on protyposis, providing insights into diverse semiotic communicative processes from a complex thinking perspective.

Below, I delve deeper into this aspect and highlight the significance of studying protyposis in relation to semiotic processes. I will, first, introduce the concept of protyposis, and explore its role in understanding the nature of reality and the intricate process of meaning making. By examining the interplay between protyposis and semiotic processes, I aim to shed light on the fundamental mechanisms that shape communication, perception, and the construction of knowledge. Through this exploration, I hope to pave the way for a more comprehensive

understanding of information and its role in the complex dynamics of biosemiotics and translation theory.

As argued above, the term information poses a fundamental problem that is primarily associated with meaning. However, meaning arises from relationships and functions that do not manifest at the quantum level. The quantum physical theory proposed by Görnitz makes it possible to define protyposis as the only basic substance that can differentiate and manifest itself as matter, energy, or meaningful information (Görnitz 2019, 15). For Görnitz, the three phenomena – matter, energy and quantum information – are equivalent, which also applies to being–properties and object–being. Thus, protyposis is presented as a monistic structure that is a hypothetical solution for the Cartesian mind–body problem (Görnitz 2016, 477).

We can define protyposis as an ontological entity that is the fundamental structure that underpins physical reality. It represents the most elementary and abstract unit of quantum information, referred to as Abstract open-meaning Quantum Information Bits (AQIBs), a concept that can be scientifically comprehended (Görnitz 2019, viii; Görnitz and Görnitz 2006, 2008, 2016). Protyposis can be conceived as completely abstract and absolute quantum information; it has no definite relative meaning and is not, in principle, bound to a specific sender or receiver.

While information is intrinsically related to meaning, it is essential to emphasise that quantum information is necessarily abstract and absolute in nature, and does not refer to something specific (Görnitz 2019, 15). A quantum bit has a two-dimensional state structure in space, which implies that objective reality is also two-dimensional (Görnitz and Görnitz 2016, 738). These qubits constitute a set of possibilities from which the realisation and actualisation of information are derived. This implies that many qubits generate complexity in the small rather than simplicity (Görnitz 2019, 1–3).

It is important to note that protyposis qubits cannot be considered particles or objects in the conventional sense, as these systems require an infinite-dimensional state space. Particle formation from the protyposis can be modelled, considering the limiting case of infinite qubits in their exact mathematical form. In quantum theory, location, extension, force, and substance are relativised (Görnitz and Görnitz 2016, 486). Protyposis, in physical phenomena, manifests itself through the qubits and spin of particles such as electrons or protons. These phenomena have a two-dimensional nature, unlike particles that have infinite dimensions. The protyposis is a quantum pre-structure with a two-dimensional complex-valued state space, including real and imaginary numbers. It is the simplest and most abstract structure that can be understood mathematically within the framework of quantum theory. Any form of meaning depends on a specific

context and requires a more complex system a (Görnitz and Görnitz 2016, 491). One can also affirm that protyposis is the elementary structure from which all underlying structures are derived. This entity is abstract because it has yet to manifest in a concrete phenomenon. Therefore, it is abstract information with all the potential to materialise into particles or meaningful information.

In short, protyposis represents a form of abstract and absolute quantum information, which can take various forms and condense into physical phenomena (Görnitz and Görnitz 2016, 544). Through qubits and quantum structures, protyposis generates effects and acquires meaning when interacting with material or energetic carriers. However, it is essential to understand that quantum information transcends conventional meaning and requires a more complex and contextualised approach for proper understanding.

Distinct from Peircean "thought-signs", protyposis is not subject to a relationship of signification with an observer or a meaningful reference system. It exists as an absolute entity and cannot be determined or defined in terms of such relationships. Instead, protyposis is an absolute magnitude analogous to zero temperature in degrees Kelvin. However, it contains the "germ of signification" (Bedeutungskeim) and is considered a structure that precedes any phenomena or processes. In this sense, protyposis can develop into particles that carry meaningful information (Görnitz 2019, 30; Görnitz and Görnitz 2016, 594).

Quantum theory also reveals that possibilities generate effects that are, in turn, effects in and of themselves, which allows us to speak of second-order facts (Görnitz and Görnitz 2016, 481–3). So AQIBs structures can generate effects, such as the materialisation of particles, and are characterised by the information they contain. For such systems to acquire meaning, they need to interact with a material or energy carrier, and the observer interprets the effect itself as meaning. In semiotics, this process is known as semiosis, where the structure can materialise as a sign or as a real or virtual object that acquires its meaning by affecting a living organism.

Semiosis implies a constant dialogue between signifier and signified, and information plays a fundamental role in conveying messages and generating interpretations. In this sense, protyposis can be seen as a primordial state of information in its most abstract and undetermined form. As signs and systems of meaning develop from protyposis, information acquires specific contexts and is related to communication, perception, and understanding.

Protyposis manifests itself in different forms: Matter is an inert form of protyposis that is resistant to change and can be localised in space and time, and which possesses a rest mass (Görnitz 2019, 16–7; Görnitz and Görnitz 2016, 501–3). In turn, energy is a form of protyposis that is necessary to set matter in motion, or cause changes in it. It could also be localised in time and act in the present. As

for information, in its strictest and most common sense, it is a form of protyposis capable of activating energies that are made available.

Görnitz's concept of protyposis challenges the clear boundaries between matter and energy, as well as matter, energy, and absolute quantum information. It addresses the problem of Cartesian dualism between *res extensa* and *res cogitans* by asserting the inseparable unity of living organisms. This unity comprises both "hardware" (the physical body) and "software" (the elaboration of meaningful information) (Görnitz and Görnitz 2016, 180–6). According to the theory of protyposis and the equivalence of matter, energy and absolute quantum information, there is no sharp distinction between these two aspects. Therefore, Görnitz argues that organisms are "uniware", and dividing biological systems into separate software and hardware components is meaningless.

Within the framework of protyposis, the notion of uniware challenges the traditional dichotomy between software and hardware in reference to biological systems (Görnitz and Görnitz 2016, 185). Instead, it emphasises the inseparability of the physical body and the elaboration of meaningful information, by recognising that they are interconnected and mutually influence aspects of living organisms. This perspective highlights the holistic nature of living systems, in which information processing and the physical body are intimately intertwined.

The inseparable connection between hardware and software in biological information processing refers to the relationship between the material forms (such as nerve cells and their molecules) of protyposis and the forms that appear as meaningful information. This connection highlights the interdependence of physical structures and information processing in living organisms (Görnitz and Görnitz 2016, 186).

It is worth noting that the integration of hardware and software is crucial for biological information processing. The material forms of protyposis provide the physical basis for the reception, transmission, and transformation of meaningful information. At the same time, the processing of meaningful information by the hardware shapes its functioning and behaviour. For instance, the distinction between hardware and software in conventional computers is crucial, because it ensures the stability and functionality of the system (Görnitz and Görnitz 2016, 186–9). Changes in the hardware can disrupt the operation of the software, leading to errors or system failures. In contrast, biological information processing in living organisms does not exhibit such a strict separation between hardware and software.

The hardware, represented by the neural cells and their molecules, interacts with and processes the meaningful information, giving rise to complex cognitive processes and behaviours. This integration of hardware and software allows for

the emergence of consciousness and the ability to interpret and respond to environmental stimuli (Görnitz 2019, 45–6).

Furthermore, in biological systems, memories and information are not only stored in the brain. Memories can be stored in various body parts, and their retrieval and processing can influence physiological responses and behaviours. This distributed information storage and processing nature in living organisms challenges the notion of a centralised hardware/software separation seen in conventional computers (Görnitz 2019, 40–1).

In summary, while conventional computers rely on a clear distinction between hardware and software, biological information processing in living organisms exhibits a more integrated and distributed relationship between material forms and meaningful information. This unity of hardware and software allows for complex cognitive processes and the emergence of consciousness. The limitations of conventional computers in replicating this highly integrated approach highlight the unique and sophisticated nature of biological information processing.

Moreover, the transcoding process involved in communication among living organisms underscores the dynamic nature of meaning and its relation to the environment (Görnitz 2019, 33–5). The exchange of meaningful information through photons and their storage within cellular components plays a crucial role in maintaining the stability of living systems.

Next, it is imperative to value the theoretical framework proposed by Kobus Marais, and its integration with protyposis. These theories offer a unique perspective on translation as a "negentropic semiotic process" that involves working out relations based on constraints. It recognises the role of possibility as a driving force for change and seeks to integrate diverse knowledge from biological, semiotic, and translatological fields (Deacon 2011; Marais 2019, 121). Moreover, by integrating the theory of protyposis (possibility, unity, causation, abstraction, ubiquity) and its potential to materialise into meaningful information, we can better understand the complexities of semiotic translation within Marais' framework.

Below, I transition from exploring protyposis to examining Kobus Marais' semiotic theory of translation (STT). First, I introduce the STT, and emphasise its relevance to studying translation and semiotic processes. I then highlight how the concept of protyposis aligns with and enhances STT, by providing valuable insights into the expansion of reality, the generation of meaning and the dynamics of semiotic translation. Second, I delve into key elements of STT related to protyposis, such as the role of constraints, negentropy, and the translation of signs. By exploring these intersections, I aim to deepen our understanding of translation as a semiotic process and its intricate dynamics within the framework of STT, and to shed light on the complexities of meaning generation and interpretation.

Theoretical framework: Marais' semiotic theory of translation

The STT put forth by Marais encompasses the diverse ways in which meaning is conveyed through translation (Marais and Kull 2016; Marais 2019, 20; 2020; Marais and Meylaerts 2019, 2021). This complex (integrative) theory asserts that translation goes beyond the mere transfer of meaning from one language to another; instead, it involves a complex process of interpretation and negotiation. Translation is a semiotic rather than a strictly linguistic process (Marais 2019, 123). This argument builds upon the insights of scholars such as Jakobson, who have hinted at the semiotic nature of translation, but have yet to fully transcend linguistic bias (Marais 2019, 104). Therefore, it is crucial to delve into the semiotic nature of translation in order to move beyond the confines of linguistic bias in translation studies.

STT stands out for its inclusive approach, by encompassing all translation process phenomena, irrespective of whether language is involved. This theory draws on inductive, deductive, and abductive conceptualisations, process thinking, complexity thinking, and emergence theory. This unique foundation allows Marais to propose a novel conceptualisation of translation as a "negentropic semiotic work performed by the application of constraints on the semiotic process" (Marais 2019, 121). In other words, translation is a process that introduces decreased entropy or disorder at a local level, and is constrained to produce a specific outcome – note that at a larger scale, entropy always continues to increase. The main theoretical frameworks supporting this concept include Peircean semiotics, biosemiotics, and Merrell's constraint-based approach to translation (Queiroz and Merrell 2006).

It is worth noting how this interdisciplinary perspective anchors my proposal to include the protyposis theory as a monadic structure underlying all the information semiotic processes. Nevertheless, important questions still arise: Why embrace this type of theory in translation studies, and does it truly address any unresolved issues that biosemiotics have already attempted to tackle? Does the STT offer novel insights into and contributions biosemiotic discourse? Does the translation description as negentropy resolve the challenges associated with meaning, or does it introduce new complexities? While the STT is primarily focused on the principles of change and process, the concept of negentropy raises questions about the precise understanding of meaning within this framework. By exploring these questions, we aim to delve into the intricate dynamics that control the transmission and transformation of information in translation.

Marais proposes a complexity approach to semiosis, where meaning is conceptualised as a process that takes shape within specific constraints. In this view, meaning encompasses both process and form, with the author emphasising the

former. Translation plays a vital role in realising meaning. Indeed, without translation, the meaning would cease to exist. Within Marais' conceptualisation, translation does not occur between stable meanings; meaning itself is an ever-evolving process of establishing relationships between meanings. These relationships are subject to constraints, giving them a particular (albeit temporary) form or trajectory. In this understanding, both the source text and the target text are viewed as processes, and their relationship is also a process. Change does not inhibit or eliminate meaning; it is inherent in the process of meaning creation. Meaning entails change, process, and the continual process of being created without reaching a final state (Marais 2019, 123).

Translation involves taking existing meanings and establishing new relationships between them, thereby generating novel meanings. This process consists of treating interpretants as new representamens and relating them to objects and new interpretants, continuing indefinitely. Therefore, translation is not merely the conversion of text from one language to another; it is a process that underlies all meaning creation (Marais 2019, 122). In this view, meaning is not fixed or static, but constantly evolving through translation. In addition, translation does not occur between stable meanings, but between incipient sign systems. Marais proposes replacing the terms source text and target text with "incipient sign system" and "subsequent sign system" to reflect this notion better. Both incipient and subsequent sign systems represent recognisable trajectories, habits, or forms within processes, but they are not stable entities.

However, it is essential to note that the stability observed in semiotic forms is not the result of absolute rigidity. Still, it exists on the boundary of chaos, manifesting as dynamic patterns and habits that adapt to changing environmental conditions and temporal considerations (Marais 2019, 138). This manifestation is rooted in AQIBs, which underlie semiosis and, in more complex structures, inherently mark a trajectory subject to some degree of variability. This process of maintaining the system stable might help to reach the equilibrium of the sign systems, but it has an energetic cost. Görnitz (2019, 34–6) argues that system stabilisation occurs through the self-stabilising information processing of living beings. Unstable or metastable systems of matter and energy, characterised by dynamic equilibria, have the ability to evaluate and interpret information. By attributing meaning and significance to information, the organism can stabilise itself by responding to its environment appropriately. This stabilisation involves establishing rules and patterns for further information processing while ensuring a continuous adaptation to changing conditions.

In the process of translating a macro sign vehicle, AQIBs manifest themself. This macro sign can be regarded as a second-order fact (Görnitz and Görnitz 2016, 481), that is, an incipient system. As expounded before, every carrier of

semiotic information is constituted by AQIBs, which means that it is constituted by possibilities and, at the same time, is an irreversible material spatiotemporal manifestation, such as a text inscribed in a book or on a screen, if we consider the text as a macro sign vehicle. Translation is an irreversible change process encompassing the difference between particles or complex systems (complex sign systems). The process occurs between phenomena localised in space and time (at times solely in time), here and now, concrete sign systems whose property is the potential to signify something specific through something abstract, dependent on interpretation and reinterpretation by a living being.

The incipient sign system can be considered a subsequent second-order sign system, as every subsequent sign system results from a translation process based on second-order facts. This does not imply circularity. Every manifestation and every carrier of significant semiotic information is constituted by protyposis, both due to the localisation process of AQIBs and because they carry protyposis "inoculated" within them as if it were a "virus" (Görnitz 2016, 534). Every information carrier is a carrier of protyposis regarding its potential for future and relocated information development. In this way, every manifestation carries a self-replicative and self-referential program, and encompasses the potential for expanding and self-replicating AQIBs. This allows for the expansion and complexification of semiotic information, promoting the emergence of new properties and objects, and the emergence of a complex system such as the *Umwelt* (von Uexküll 2011; 2014).

The control and self-regulation of living beings over translation processes are accomplished through gradients. A gradient, in the context of this discussion, refers to a spatial or temporal variation in a physical property, such as temperature, concentration, or pressure. Gradients play a crucial role in driving both processes and movements within living systems while serving as necessary conditions for establishing a dynamic equilibrium and flow of matter and energy (Görnitz 2019, 35–6). The resulting mechanism ensures the balance between incipient and subsequent systems. Living beings respond to and utilise these gradients to maintain and regulate their internal states (cognitive, emotional and imaginative) and facilitate essential processes, such as interacting with the *Umwelt* (understood as a space of significant semiotic information).

Translation, as conceived by the STT framework, is characterised as a negentropic semiotic process that operates through the imposition of constraints on the range of possible meanings. Negentropy, in the context of this theory, refers to the capacity of systems to temporarily overcome the natural increase in disorder over time or within localised spaces. Marais argues that negentropy allows us to comprehend how translators work to decrease the entropy of the text, to present in a more organised and meaningful translation. This process represents the under-

lying force that propels semiosis, the generation and interpretation of signs and their associated meanings (Marais 2019, 125–8).

If we interpret protyposis as entropy and consider it as an abstract and absolute entity, we imply that quantum information lacks inherent meaning. In this perspective, entropy measures the amount of inaccessible or unspecified information and, therefore, lacks specific meaning (Görnitz and Görnitz 2016, 517). Consequently, every translation process that originates from AQIBs refers to protyposis, because protyposis, as a compensatory mechanism of possibilities, represents a second-order fact that encompasses a set of potentialities. We can understand protyposis as abstract quantum information that can acquire meaning within specific constraints. These constraints shape and define the transformation of protyposis into meaningful information, thereby providing a context for the emergence of significance. By considering protyposis within the entropy framework, we deepen our understanding of how information evolves and gains meaning in the complex realm of semiosis.

All translations between sign systems depend on space and time. Time implies that the greater the temporal distance between an incipient system and its interpretation by a present living being, the bigger the possibility of the "result" being affected by significant information. This is a result of entropy variation. Greater availability or higher informational complexity leads to greater localisation and vice versa.

Therefore, the meaning of a text emerges as a result of the interplay between semiotic patterns, but it is important to understand that meaning is not an independent or stable entity on its own. Instead, meaning is relative in its stability, and intrinsically connected to the broader process of semiosis, where signs are in constant flux and subject to ongoing interpretation and reinterpretation (Marais 2019, 122–6). This fluidity and flexibility in meaning creation through translation allow new and novel meanings and interpretations to emerge.

Within the STT framework, translation goes beyond its role as a mediator between signs. It establishes and transforming relationships among representamens, objects, and interpretants. This expanded perspective recognises that signs are not isolated entities or mere representations of objects, but derive their significance from the interconnectedness and interplay of these relationships. Thus, translation encompasses any changes or movements within these relationships, be it in spatial or temporal dimensions, and it also encompasses the generation of new connections during the translation process.

Protyposis can be seen as a hidden concept in itself. It represents the fundamental possibilities that can lead to the emergence of consciousness and the manifestations of matter and energy. While protyposis itself lacks immediate consciousness or meaning, it serves as the foundational structure from which signs

and systems of signification emerge. This aligns with the notions of indeterminacy and potentiality in semiosis, by highlighting the transformative power of protyposis to generate meaningful information. The indeterminacy underscores the challenge of precisely reproducing semiotic processes, since predicting how different individuals may perceive and understand the same sign is impossible. Furthermore, this understanding emphasises the fluidity of meaning, which necessitates ongoing reconstruction over time. Marais' theory contends that meaning cannot be definitively grasped, but is always subject to interpretation and reinterpretation based on context and perspective. Yet, all these processes and functions emerge from the complexification of protyposis phenomena, including matter, energy, and meaningful information. This is crucial for generating increasing amounts of information and reducing entropy in living systems, which require significant energy consumption to maintain stability (Marais 2019, 138–9).

Thus, translation should be seen as an ongoing process that never reaches a state of completion, because it is constituted and driven teleologicaly by AQIBs. This perspective challenges the conventional notion that translation is a single, definitive event. Understanding translation in this way becomes crucial, as it reflects the ever-changing nature of the world. Living systems can counteract entropy by conserving energy, and demonstrating that history evolves to maintain energy levels rather than repeating itself. Recognising these principles enables us to understand our place in the universe and its laws better.

The crux of Marais' theory lies in the understanding that the outcome of all semiotic processes is the creation of interpretants, which refers to interpretation itself. Any change in any aspect of the process results from a change in the outcome, that is, the interpretant that emerges from the semiotic process (Marais 2019, 129). However, it is essential to note that semiotic processes are not fully reversible. Translation is an example of a semiotic process wherein meaning constantly evolves through transforming signs into other forms in view of the nature of its AQIB.

STT posits that semiosis and meaning creation follow a three-step process with tangible and material components. The first step involves the creation of a representamen, or sign. The second step entails establishing a relationship between the representamen and an object, and forming a cohesive connection. Finally, the third step occurs when the interpretant mediates between itself and the object, giving rise to a meaningful relationship. This sign-production process underscores the complexity and indeterminacy of meaning, which can only be comprehended within specific contexts and perspectives. Furthermore, this dynamic nature of meaning allows for its constant reconstruction over time, which renders it impossible to replicate semiotic processes accurately (Marais 2019; Merrell 2000).

Marais' perspective on meaning emphasises the relational process through which it emerges. To reinforce a point implied earlier, instead of being predetermined or determined, meaning arises from a state of chaos and is shaped by the constraints imposed by the meaning maker and the meaning-taker interaction (Marais 2019, 130–1). The interplay of these elements in semiosis is vital, as signs are formed through their dynamic interaction.

Semiosis occurs within a specific space-time continuum, and three modes of existence – possibility, actuality, and potentiality – interact to allow the emergence of meaning from chaos (Marais 2019). The significance of a sign is not fixed or predetermined, but is instead constrained by the meaning maker and the meaning-taker. The process of creating meaning involves the interplay of various causal factors, including the nature of the representamen being created and the contextual space-time framework in which it occurs. Once again, meaning is not static or absolute. It evolves and adapts to different contexts, and its interpretation is subject to the constraints and dynamics of the emergent process and the specific representamen being considered. This understanding highlights the dynamic and ever-changing nature of meaning, thereby challenging the notion of fixed and definitive interpretations (Marais 2019, 132).

Marais argues that the word we encounter in translation is not a sign (Marais 2019, 144). Instead, he views it as a vehicle that initiates the semiotic process. The word enables the semiotic agent to establish a relationship with an object and mediate between the representamen (or sign vehicle) and the object by creating an interpretant. In other words, the principles of formal logic cannot be applied to the interpretation of a sign, because meaning is indeterminate, vague, general, inconsistent, and incomplete. The sign vehicle should determine the interpreter for semiotic information to affect the observer. This sign translation and understanding process occurs when the interpreter assigns concrete meaning to the information. According to Görnitz (2019, 33–5), communication is a continuous transcoding process between living organisms and their environment, involving the transfer meaningful information through photons and storage within cellular components. This enables the thermodynamically unstable system of living beings to achieve stability.

Through the lens of complexity theory, Marais emphasises that culture is shaped through translation as a negentropic process of working with semiotic information. This affirmation means that translation contributes to the upward and downward flow of cultural development. To illustrate this concept, Marais (2019, 136–7) introduces the notion of an attractor, representing a point towards which substances, such as water, tend to flow. In translation, the attractor is a reference point for identifying patterns and tendencies within translation processes.

It is important to note that not all translations will conform precisely to the attractor, but studying these patterns can provide valuable insights.

I suggest that, despite attempts to introduce explanatory factors for the emergence of culture, it is crucial to acknowledge the insights provided by quantum theory. Quantum theory reveals that possibilities generate effects, which, in turn, become effects in and of themselves. Therefore, we propose that protyposis, as the underlying structure, offers a more comprehensive framework for understanding the evolution of the cosmos, life, and culture. This evolutionary process entails a transition from simple structures to increasingly complex ones, leading to the realisation of properties and objects in space and time.

The concept of emergence becomes meaningful when viewed as a continuous process with protyposis as its elementary structure, which serves as the condition of possibility for the manifestation of society or culture through translation (Marais 2019, 158). Unlike the condition of being bound to any specific material or energetic carrier, protyposis transcends the constraints of space and time, and is omnipresent. Elementary structures, by their very nature, defy localisation. Protyposis, as the elementary structure, encompasses all possibilities, functioning as a differentiating and foundational principle.

As a result, the formation of molecules, organs, living organisms, and more complex systems, such as societies or cultures, can be attributed to the inherent possibility of their manifestation, which existed from the very beginning in nature. Protyposis, as the fundamental structure, contains the potentiality for these diverse manifestations to emerge.

By recognising the fundamental role of protyposis in comprehending the evolution of the cosmos, life, and culture, it is clear that we gain a deeper understanding of the interconnectedness and ongoing process of manifestation. This perspective emphasises the intrinsic potentiality and pervasive nature of protyposis, which facilitates the realisation of possibilities and shapes the complexity of our world.

Conclusion

By critically reviewing and assessing the theory of protyposis, it becomes evident that it possesses explanatory power as a theory of possibility. Protyposis, as an absolute and abstract informational magnitude known as AQIBs, functions as an "inherent meaning germ". This potential for significance is both everything and nothing, and represents the capacity for new meanings while lacking immediate significance. The greater the amount of information, the more the definition of reality expands.

Marais' STT is grounded in a process ontology and a systemic view of translation, which regards possibility as a catalyst for change. Protyposis emerges as a promising candidate for driving the materialisation of meaningful information. It serves as the foundational structure underlying all informational processual phenomena with meaning and demonstrates the possibility of semiosis. Protyposis exists as both nothing and everything simultaneously, allowing it to materialise into meaningful information through a negentropic process that imposes constraints. In this process, patterns, forms, and trajectories contribute to the determination of meaning as the amount of information increases.

Marais' STT is a theory of possibility that provides a framework and tools for bridging gaps between different realms of knowledge. By incorporating structuralism and poststructuralism, it establishes a new, unified theoretical model that encompasses multiple disciplines. The central concept of protyposis serves as the foundation for Marais' negentropic semiotic work. Additionally, Marais' exploration of the negentropy of semiotic work offers valuable insights into the complexity and universality of translation process phenomena. Translation, understood as a semiotic informational process, involves the transmission of semiotic information and extends beyond the mere exchange of meaning between languages.

Protyposis also confirms Merrell's (2000) intuition regarding the unity of body and mind. It suggests that content and information carriers should be considered as integral parts of a whole, despite their apparent distinctions. Through protyposis, we gain understanding of how different translation processes interact and create infinite translation processes. This understanding resolves the paradox of Cartesian dualism between *res extensa* and *res cogitans* by demonstrating that the borders between matter, energy, and quantum information are not clearly defined. Protyposis affirms that living beings are an inseparable unity named uniware, composed of both hardware (the physical body) and software (the elaboration of meaningful information).

Furthermore, protyposis provides insight into the relationship between intentionality and consciousness. I suggest that considering AQIB enables a deeper understanding of conscious experiences of living organisms by exploring the translation of representamen, object, and interpretant. Translation can be seen as a means of bridging gaps between different realms of knowledge, and can facilitate connections between previously unrelated fields, and unlock a profound understanding of the world and reality.

It becomes apparent that translation is not merely about the exchange of meaning between languages, but rather an active dialogue among disciplines. This perspective allows us to better appreciate the universality and complexity of the underlying AQIB in semiosis processes. Clearly, Marais' negentropy of semi-

otic work and Görnitz's protyposis make invaluable contributions to the field of translation and enhance our understanding of living organisms and their environments.

As emphasised above, a semiotic translation theory should capture the potentiality of generating meaningful information. Thus, it should be open to new forms of knowledge organisation, referred to as disciplines here. The STT encourages the proliferation of knowledge beyond conventional disciplinary boundaries. Marais proposes an organisation of knowledge that transcends traditional subject areas, integrating them into a new entity that I suggest we call transdiscipline. This concept, influenced by Morin, Basarab, and Cronin's eco-translation theory (Basarab 1996; Cronin 2017; Morin 1978, 1998), aims to represent a holistic interpretation of reality and embodies an epistemology of possibility. This transdiscipline is based on a monistic structure as protyposis, where every manifestation is included, but has yet to evolve. Here, complex means all the possibilities of realisation that affect systems that are themselves possibilities; there is no single knowledge or signification related to a subject. This discipline is a stationary and self-controlled system. By adopting a transdisciplinary approach, we strive to provide a more comprehensive understanding of translation as a complex and multifaceted phenomenon. This perspective allows for a deeper exploration of the intricate processes involved in translation, and to transcend the limitations of any single discipline.

The goal of this chapter was to propose a transdisciplinarity, as distinguished from interdisciplinarity (Hoffmeyer 2008), that involves transferring methods and creating new disciplines. This framework aims to advance translation studies by integrating diverse disciplinary perspectives, and fostering a more nuanced and holistic understanding of translation as a dynamic and ever-evolving phenomenon. Furthermore, it provides a theoretical basis for exploring the complexities of translation processes and opens avenues for future research and transdisciplinary collaborations. Accordingly, I conceptualised translation as a complex semiotic process in various spheres of reality while recognising a common element across all disciplines: Translation is an infinitely complex process of generating meaningful information.

As stated above, translation's theory should embrace the concept of possibility (Görnitz 2016, 2019). This perspective acknowledges translation as a semiotic information process. However, the informational semiotic approach to translation is paradoxical: it exhibits determinism by establishing the constraints or conditions under which a sign represents an object (Cannizzaro 2016). While it is not a causal relationship, the object plays a decisive role in shaping the sign. Simultaneously, translation or semiosis is indeterministic, as it depends on an elementary structure that precedes the emergence of meaning but can generate it at the

same time. In this context, transdiscipline offers a comprehensive understanding of informational processes based on protyposis. It sheds light on how knowledge can be disseminated in ways that contribute meaningfully to our evolving conceptualisation of reality. Rather than confining translation to the mere transfer of language, Marais' approach encompasses all forms of semiotic information processes, and portrays a much more intricate and complex process.

Ultimately, Marais' framework enables a better grasp of the dichotomy between determinism and indeterminism in complex information processes. By appreciating the multifaceted nature of negentropic semiotic work, its capacity to shape meaning in an infinite semiotic information process becomes evident. Furthermore, this theory bridges the gap between knowledge from different realms, thereby fostering further research into translation as a matrix of diverse phenomena.

By embracing Marais' STT and Görnitz's protyposis, we should be able to benefit from insights into consciousness and its interconnectedness with the world around living organisms. This comprehensive approach to translation not only enhances our understanding of semiosis, but also contributes to the broader comprehension of reality, knowledge, and meaningful information.

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