

MARCUSIAN POETICS – A TRANSDISCIPLINARY HERMENEUTIC EXERCISE

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Abstract

The linguistic competence is associated with the poetic one, in a complementarity that contributes significantly to the cultural competence. They provide deep knowledge, broadening the cognitive universe of the reader. The writing process is associated with that of decoding the poetic text, based on mathematical formulas and putting the art of the word and the science of mathematics on the same level. Solomon Marcus opened the perspective of a transdisciplinary approach to the knowledge of reality and, in symmetry, of poetic knowledge, theoretically explaining and applying the principles of mathematical poetics.

Keywords: *mathematical poetics, denotative, connotative, generative grammars, linguistic competence, poetic competence, decoding, transdisciplinary hermeneutics.*

Joining the studies in the fields dedicated to the hermeneutics of the fictional text, a new branch generated in the intersection area of sciences and humanities was foreshadowed in the last part of the 1950s, benefiting from the solid argumentation for the application in the process of decoding the message transmitted through literary creations belonging especially to the lyrical genre.

In the '70s, Solomon Marcus published the pioneering work entitled *Mathematical Poetics*, intended to probe, on a scientific basis, the message in lyrical texts. On the occasion of the publication of this work, Grigore C. Moisil wrote: “The volume is due to a mathematician who made himself known to the international scientific world through his profound works of pure mathematics and through his essential contribution to the development of a new science.” Solomon Marcus was the creator of the school, not only of mathematics, but also of linguistics, a field of study that is primarily related to the philological field. Miraculous for everyone! From *Mathematical Linguistics. Mathematical Models in Linguistics* (1963), to

Grammars and Finite Automata (1964), Solomon Marcus' work discusses various forms of communication, as an expression of the social dimension of our being. My enthusiasm after I read, during my student days, the two books, *Mathematical Poetics* and *Mathematical Linguistics*, worked together with the Master's willingness to support me, in demonstrating that in Romania, the school he created became fruitful. Completing the theorizing process in the exceptional work entitled *Mathematical Poetics*, Marcus proposes the discovery and understanding of the rules that govern the poetic creation.

Solomon Marcus launched two new concepts, which would prove to be visionary, increasing knowledge. The two works that revolutionized the sciences and arts offered a perspective of reshaping knowledge, offering the monodisciplinary one, the transdisciplinary alternative and thus adapting it to the theory of complexity that defines the millennium in which we currently find ourselves. Time has validated Marcus's ideas and today the field based on the principles of mathematics builds artistic universes. The relationship between science and arts was theorized by Solomon Marcus starting from metaphor, as an expression form of the reception of reality.

Poetry represents the maximum concentration of the meanings of human existence in time, space and being, through a laborious process of deep metaphorization, distillation and redistillation of the everyday, historical, personal and universal concrete. As a product of this complex process, the poetic text becomes an axiom in which the reader discovers his self. If he is an initiate, poetry is perceived as an equation, an equality with known and unknown

elements, which is verified by the personalized values that the author proposes for the unknown. Therefore, in front of the poetic text, the reader can experience either the pleasure of the captive in an ideal, pre-established ontological model, or the satisfaction of the co-participant in the construction of meaning. The process is a dynamic and infinite one, arguing that each creation becomes a starting point in new incursions for the discovery of the fictional text, in all its complexity of meanings.

Whatever the position we find ourselves in, from novice to initiated, *Mathematical Poetics*, provokes the experience of a revelation. Poetry generously offers a training space for authentic, personalized knowledge, by probing the abyssal structures that the poetic text has. In his *Poetics*, Aristotle argues that *learning* is a pleasure, not only for philosophers, but also for other people; only they taste it very little. In the Aristotelian sense, *Mathematical Poetics stimulates* the necessary learning in the complex process of understanding the world, in its version transfigured through art. One can find a warning made by Solomon Marcus in this regard in the introductory part of *Mathematical Poetics*: “*The book presupposes, on the part of the readers, a certain habit of both mathematical and linguistic structures and linguistic. But the different parts of the book present different degrees of mathematization. This fact and the relative independence of the chapters make it possible for the book to be partially read even by a reader less initiated in mathematics or linguistics.*”

Marcus believes that “*Mathematics is, first and foremost, a method of thinking, not a collection of formulas,*” thus opening up a new exploratory perspective on knowledge. The world is seen through a lens that, starting from the concrete image, reveals multiple depths, explored individually through the cognitive competence of each one. Thus, as a method of thinking, mathematics represents the exploratory tool for the entire universe, from its perceptible concreteness, to the infinite meanings, discovered through a complex process of immersion in their infinite depths. In the dynamics of the phenomenon of signification, the deeper you penetrate into the mysteries of the world, the more you realize that the process of knowledge deepens, demonstrating its infinity, as an

essential dimension. This process is a generative one, through which every step towards the depths of the world reinforces the realization that the distance does not become closer, but on the contrary, entices us to take the next step, thus repeating the same observation: any closeness is a revelation that carries forward the goal of our journey, the finite melting into infinity.

In order to offer an alternative to knowledge, through a transdisciplinary approach, Solomon Marcus reconciles apparently two opposite fields, arguing the relationship between mathematics and literature, each perceived for a time as opposite to the other, as a method of knowing the world.

In Lovinescu’s spirit, the mathematician confirms that the translation of poetic language is not possible, because “*suggestive values cannot be translated by simple notional transposition.*” This Lovinescu finding is also identified by Solomon Marcus with regard to mathematical language. Poetic language and mathematical language can be understood differently, depending on the culture of those who come into contact with these communication codes. Primary mathematics, which aims at the pragmatic, immediate aspect of calculus formulas for everyday life, thus supports its utilitarian and concrete aspect. The poetic language has the power of primary suggestion, through the first layer of signification, aiming at the denotative with slight contacts with the connotative area. Thus, a poem, even a hermetic one, has a primary meaning for any connoisseur of the linguistic code. Deep cognitive access involves decoding in the spirit of the connotative. It is known that reading *Luceafarul* leads to an understanding in layers, depending on the age and cultural level of the reader. The reaction to the text starts from a superficial one, which perceives the word with its primary meaning, to the deep, philosophical layers, whose approach requires a high cultural level. In this context, the question arises from the way in which literary translations could betray the multiple meanings of the lyric, in particular.

Charles Bally and Jean Cohen consider that **poetic language** manifests itself as a deviation from the **usual language**, from which the distancing is observed through the contextualization and recontextualization of the

common word. In *Mathematical Poetics*, Solomon Marcus demonstrates that **poetic language** must be seen in relation to **scientific language**, because this is a concept characterized by rigor, being located in the area of objectivity, while **the usual language** is more complex, and cannot be taken as a referential for defining poetic language. The usual form of language is considered a product of the subjective hybridization of languages both **scientifically** and **poetically**, respectively, from which its complexity also results, especially since pragmatics puts the speaker in the same equation, with all his details of unique identity in a sociocultural context. Solomon Marcus accepts the opinion that **poetic language is a deviation**, having the scientific language as a reference. This is a zero-degree genre, paraphrasing Roland Barthes, with his work **Writing Degree Zero**.

On the other hand, the conceptions of Jan Mukarovsky or Roman Jakobson are positioned in a grid similar to that of Solomon Marcus, in relation to poetic language, seen as deviation. Jakobson identified **the poetic function** in the common, normal language, and Mukarovsky called the emphasis of language in the literary message. Thus, poetic language can be regarded as a coherent semiotic system, having its own rules, its own grammar, elements that develop the poetic component. Interestingly, **poetic language** remains in direct relation to **normal language**, but receives connotations from **everyday language**.

Solomon Marcus starts from the premise that the opposition on the basis of which the analysis of the two types of language (**poetic** and **mathematical**) is made consists in the fact that **scientific language** is characterized by **denotation**, and **poetic language**, by **connotation**.

This way of approaching the lyrical text requires an initiation of those who use either mathematical or poetic language, in order to acquire the chance to penetrate the deep layers of the text, expressed in these specialized languages. Like Louis Aragon, Solomon Marcus also considered that the two major fields to which **mathematics** and **poetry belong**, respectively, are the **Sciences** and the **Literature**, respectively. Centrally positioned, each in its own field, **mathematics** and **poetry** represent a nucleus that influences the generation of the other literary

species. Marcus believes that *"the novel must be based on the discoveries of poetry, just as the sciences progress when they use mathematics."*

Here is the argument that Solomon Marcus makes for the readers of **Mathematical Poetics**:

"I considered an idealized concept of poetic language, which I opposed to an idealized concept of scientific language. The structure of poetic language is therefore established not from within itself, as a quality in itself, or from the outside, in relation to that "degree zero" that scientific language represents, a language from which any connotation is excluded." The mathematician considers that, from the perspective of construction, *"The contrast between the discrete, algebraic structure of scientific meaning and the continuous, topological structure of lyrical meaning transforms scientific language into the term of reference for the study of poetic language, as a deviant language, in contrast to the habit of taking common language as a term of reference in such a study."*

The content of the book starts from the mathematical modelling of the opposition between poetic language and the language of scientific judgment, drawing attention to the phenomenon that occurs when a certain degree of abstraction occurs, which leads to the conclusion that poetic language is a deviant language. For this reason, Marcus proposes an approach from the perspective of semantic language, the one that involves contextualization as a form of validation of meaning. An important role is played by the index of synonymy and homonymy, which together build the area of influence in the communication of lyrical language, opening the way to the nature of lyrical meaning and favouring a system of typologies associated with this type of language. The syntactic homonymy leads to ambiguity, thus building two planes of communication: one of surface and the other, of depth. Therefore, the perspective on the structural aspects of poetry is opened, bringing to the fore the semantic trees that define the lyrical text. Mathematical language can argue the distance between meanings, thus demonstrating that there is an index of receptivity that belongs to the receiver of the message, as a form of particularization of meaning. This remark supports the possibility of the reader to become the author's co-participant in the process of

meaning and implicitly, of creating meaning, confirming what Solomon Marcus called the index of receptivity.

Solomon Marcus does not absolutize the method of analysing the virtues of meaning, of symbolization, that poetic language has, through mathematical formulas and considers that we will continue to work with *“its representation as deviant language.”* Deviation from the norm implies the acceptance of the derogations, applied in the analysis of poetic language. Through concentration, this aspect communicates and the result can be analysed with the old practices of stylistics, poetics, literary theory, semantics, pragmatics, etc. However, Marcus also sees drawbacks in accepting the idea that the poetic language represents a deviant language, because ordinary language is neither scientific nor poetic, but a non-scientific product. Therefore, it cannot be referential for the poetic, defined or theorized language.

Roman Jakobson distinguishes within normal language a poetic function, consisting in what Mukarowski called the emphasizing of language in the literary message. Solomon Marcus considered that the combination of poetic language and scientific language corresponds to the two fundamental hypostases of the human being: **the rational hypostasis** and **the emotional hypostasis**.

While the conciseness of scientific language (especially in its supreme form, that of mathematical language), is given by its particularly high syllogistic density, by the minimization of everything that is foreign to the logical operators strictly necessary in utterances and demonstrations, the conciseness of poetic language (especially in its supreme form, that of lyrical language) is given by its special suggestive density, by the avoidance of direct expression, by the minimization of routine elements. In this sense, Mallarmé said, *“To name a thing is to suppress three-quarters of the pleasure of the human being, which is made by gradual divination: to suggest it, this is the dream.”*

The theorem belongs to the mathematical thought and language, being seen by the mathematical poet Ion Barbu - Barbilian *“as an august text, as an inscription whose laconism is the very guarantee of its durability.”* Solomon Marcus

considered that *“in mathematical language, the heuristic function is characterized by conciseness, everything being condensed and capable of creating suggestions.”* The hermeneutical incursions of philologists or mathematicians lead to the conclusion that a lyrical sequence supports the process of exploring new areas of human sensitivity, being a key to reading not only the text, but also the inner soul of the being. It seems incredible that the sciences, through mathematics, become compatible with the affective part of the being, coming from the rational part.

Marcus argues that precisely because it is inequivalent, the poetic expression carries a semantic charge, incomparably richer than the scientific expression. The poetic expression is characterized by openness, by its semantic becoming according to the one who receives it. *“We could say that it submits to a cybernetic action, the reader acting on its meaning as a true reverse link.”* Compared to the poetic expression, the scientific expression *lacks openness*, and its meaning is independent on the one who receives it, the reading becoming a surface one.

A good friend of Solomon Marcus, Umberto Eco observes, also from a semiotic perspective, the fact that there are different degrees of openness: the openness devoid of a proper ambiguity, passing through the usual ambiguity of modern poetry and going up to the opening of the work in motion. Here is a dynamic process that stimulates the reader's authority, therefore contributing to the choice of the further evolution of the work and the creation of meaning.

For his part, Damaso Alonso comes up with an argument that there are as many readings as there are readers. Thus, it intervenes in the equation of creating meaning, together with the author and the reader, increasing the range of meanings of a creation, especially when it comes to the lyrical one. Regarding the opinion of Umberto Eco, Solomon Marcus notes that the variability of poetic meaning from one reader to another does not make scientific research of the poetic work impossible, but only makes it difficult, through the multitude of hermeneutical perspectives. At the same time, Marcus observes that Umberto Eco proved to be permeable to some modern ideas of information theory. Regarding the opinions of the established critics

in Romania, Solomon Marcus remarks: *"We must note with bitterness that, in our country, George Călinescu strove to demonstrate the impossibility of a scientific aesthetics at a time when some studies in this regard by Pius Servien had already appeared, in which the conception, so current today, is developing, according to which literary aesthetics is seen as a science. Its object is the study of poetic language, with the help of scientific language. In other words, this subject elaborates appraisals on poetic language, but these appraisals are not also formulated in terms of poetic language (as happens in literary criticism, which claims to be a branch of fictional literature, as it is the case of the literary criticism employed by George Călinescu, but in terms of scientific language.)"*

The equivocations of ignorance are sometimes presented as ambushes and mysteries of poetry, thus replacing the authentic effort to reach the suggestive riches of the text by an arbitrary interpretation deriving exclusively from the reader's *"intuition."* The conclusion reached by Solomon Marcus is firmly expressed, in an argumentative manner that defines the functionality of the two types of languages: *the mathematical language and the poetic language: "One can notice, from everything presented above, that in scientific language there is a concordance between the discrete and infinitely countable character of the expression and the character - also discrete and infinitely countable - of the meaning, while in the poetic language there is a permanent contradiction between the discrete, countable character of the expression and the continuous, innumerable character of the meaning."* He considers that this contradiction supports the ineffable of the poetic.

The mathematician observes the poetic state of language generated by the connotative character, which supports innovation and novelty, features specific to the artistic creation. On the other hand, in complete opposition, the scientific language is under the sign of routine, standardization, stereotyping and it obeys previously established conventions. Therefore, the conventionality of scientific language and the unconventionality of poetic language appear. On the other hand, templates and stereotypes define both poetic and scientific language, which translates into the style of each author, into his creative formulas. Solomon Marcus observes: *"The greater a poet is, the more pronounced and the*

more personal his patterns become. This is also why great poets are parodied more easily than second-rate poets." It is no coincidence that the first algebraic model of poetry was the parody model, obtained with the help of an automaton.

Computer modelling capitalizes on the combinatorial possibilities of stereotyped structures present in the literary work. The example given by Solomon Marcus regarding computer modelling, based on stereotypes, is that of Edmond Nicolau who composed, through the technique of random montage, two quatrains, having as a template the Rubaiyat of the poet-mathematician Omar Khayyam. They were randomly segmented into fragments of different sizes and, based on an algorithm and using random numbers, these sequences were recombined, with the help of the computer. This technique capitalizes on the practice of algorithmic writing, therefore identifying those stereotypes that build a poet's style.

Solomon Marcus concludes on the usefulness of these practices: *"By better understanding the combinatorial virtualities of the recurrent elements of the poetic language, distancing ourselves from them and objectifying ourselves in relation to them, we gain a deeper perspective of the truly creative aspects of poetic language."*

If we now put together two poems, one written by Nichita Stănescu and dedicated to Solomon Marcus, and another one written by the mathematician about zero and infinity, the way of constructing the poetic text will be revealed to the reader. In relation to the text written by Nichita Stănescu, under the sign of inspiration, the poet lets the verse build itself freely, capitalizing on the connotative valence and generating deep symbols. The mathematician focuses his attention on the contextual versatility of the word, in order to express important ideas, whose symbolic status is similar to axioms. Although scientific language updates the artificial model, there is a tendency to use conventions, in the spirit of assuming the objective character, constructing scientific meanings, whose universal character is known. The natural language, expressed by the linguistic sign constructs notional meanings, represents the material used in a particular way by poetic language, whose plural and open meanings build the sphere of

subjectivity, of the individuality of the author. Regarding the process of poetic signification, at the level of each individual, Solomon Marcus argues that it is like a flowing river, always different from one moment to another, while the scientific meaning “*is fixed in space and constant over time*” and it is meant to account for “*a continuous infinity of meanings, the perception of which exceeds the possibilities of any human sensibility.*” Poetic language is meant to construct the individual’s universe of the spell, also determining his assumption of the state of religiosity, while the scientific language has the artificial note of conventions and requires the individual to be lucid. Therefore, positioned between poetic and scientific language, man oscillates between connotative and denotative, between logic and dreaming, between conventionality and the full power of the poetic word in order to generate and maintain the dreaming state. Reconciling the plans of linguistic communication, Solomon Marcus concludes: “*The concept of linguistic competence, introduced into science by Chomsky, a concept that constitutes the main object of study of the theory of generative grams, extends also to the poetic language, encompassing the poetic competence and, respectively, poeticity.*”

The present article represents a brief presentation of the ideas that were the basis of the book *Mathematical Poetics*, explaining the fact that poetry remains an exercise in creation, whether it is the product of the inspiration of a brilliant poet, such as Nichita Stănescu, or whether it is the formula of bringing to attention the power of the common word in order to recontextualize itself poetically, as Marcus himself presents the poem *0 and infinity are brothers*, thus stimulating the deepening of innovative ideas in order to create a valuable poetic harvest on a common substrate of science and art. The work *Mathematical Poetics* deepens the generation of poetic language, on linguistic grounds and resorting to the techniques of generative grammars breaks the boundary between sciences and arts, giving its vision a purely scientific character. Mathematical logic is the one that places the figures of speech constructed as deviations from scientific language, in relation to the process of poetic

communication, highlighting the effects of metaphorization. On the other hand, poetic deviations, seen as deviations from the norm, are viewed from the perspective of generative grammars, and Miller and Chomsky consider that deviations from grammaticality lead to an inexhaustible range of poetic procedures, achieving an astonishing richness of artistic expression. Capitalizing on this idea, Chomsky proposes that poetic language, as a deviation from the norm, be analysed with the means of generative grammars, which aim precisely at observing the norm. Therefore, deviations related to poetics are studied with the help of generative grammars that “*simulate the linguistic activity of the human brain,*” deviations from the norm being classified according to the generative rules that are violated. Paradoxically, non-compliance with the rules of the norm requires finding new rules for the functioning of the deviations from the norm. Therefore, in Chomsky’s view, generative grammar can therefore create, by classifying deviations and putting them into a kind of poetic norm, rules for generating poetic language and implicitly for its decoding, argued, as in the process of decoding scientific language. Solomon Marcus observes that that linguistic competence measurable by generative grammar justifies the launch and support, in symmetry, of poetic competence, as Klauss Baumgärtner, briefly called it poetics. In the chapter entitled *The Syntagmatization of Paradigms and the Paradigmatization of Phrases*, Solomon Marcus talks about the essence of structural poetics, enunciated by Roman Jakobson, who synthetically explains the generative process: “*The poetic function projects the principle of equivalence from the axis of selection, onto the axis of combination,*” bringing into discussion the relationship between aesthetics and semantics, to which Roland Barthes also subscribes.

The following subchapters of Marcusian poetics bring to attention and clarify concepts from linguistics, in relation to the new poetic competence we have just talked about, making a plea with clear scientific arguments, from the field of mathematics, for this new type of competence, defined precisely by various deviations from the norm, but encompassing the linguistic competence itself. Solomon Marcus

observes that in decoding the message, the paradigmization of the phrase is an essential procedure within the act of the scientific understanding of language in general and of the poetic language in particular. In creation, as a generative process, the poet syntagmatizes paradigms, thus constructing the image of a process in the mirror. We can therefore deduce that the real and the fictional build their functional symmetry, through the relationship between the scientific language and the poetic language.

In the same sense, Tzevetan Todorov identifies four categories of anomalies: of language, about the relationship between sound and meaning, another category of *syntactic anomalies*, another category of *semantic anomalies* and a final category concerning the *relationship between sign and referent*. The development of the argumentation is carried out with mathematical means applied to poetic texts, thus demonstrating that at the basis of an act of creation that capitalizes on the expressive potential of the contextualized word are combinatorial rules that, in the process of decoding, offer the receiver rigorous tools, related to science and are used in the process of understanding art. Speaking of metaphor, Marcus extends the study from the field of literature to that of science, explicitly of

mathematics, starting from the mode of generation and going to the functional essence of metaphor. There are obviously also specific differences between the poetic metaphor and the mathematical metaphor, which Solomon Marcus explains. It is precisely this denominative and utilitarian similarity, which the mathematician theorizes, then exemplifies, that validates mathematical poetics in the process of generating and understanding the poetic competence, using the linguistic competence as a reference.

One way to access the mathematical methods of studying the poetic text is the statistics that stylists have always used in order to demonstrate that the frequency of some elements leads to a conclusion and justifies an interpretation of meanings, of their aesthetic function.

The last part of Solomon Marcus's book is dedicated to the theatre, in the construction of the dramatic text, the mathematician discovering mathematical formulas that generate a deep symbolism (Marcus, 1970).

References

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