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## SYNERGY AS ONE OF THE CONSTRUCTIVE PRINCIPLES OF THE SYSTEM FORMATION

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### *Abstract*

The article discusses the specific interpretations of the synergistic property in different systems. Here is given short list of standpoints on the role of the synergetic property in the system formation. In order to solve the problems arising during the analysis of the system, and especially in the study of its synergetic phenomenon, synergetics as a science should determine methodological research principles and include them in the existing system of scientific knowledge. Many scientists see the solution as follows: the construction of a special picture of the examined reality (disciplinary ontology of synergetics), the formation of ideals and norms of synergetic research (ideals and norms of explanation and description, evidence and justification, structure and construction of knowledge), the development of philosophical basis in synergetics, providing a justification for its picture of the reality, as well as its methodological settings, expressing the accepted ideals and norms of research. It is noted that today, in accordance with a new, anthropomorphic understanding of existence and consciousness, the synergistic processes occurring in any system are the subject of close attention of scientists. All these methods and analytical forms, such as system evolution, dissipative structures, dynamic chaos, space and time, etc. are widely used in linguistics today. Particular attention is paid to the language system, since, according to many studies, the language itself, as well as the structure of its interaction, support the development of a system that includes thinking, psyche, and cultural structure of society.

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## 1. Introduction

One of the most complex phenomena is the problem of synergy and synergetic processes in the organization of the system. The complexity of this phenomenon, firstly, lies in the fact that modern scientific concepts cannot yet determine semantic or morphological basis that helps to organize a nonlinear system. All attempts to explain the nature of the self-organization of a nonlinear system are limited only to the description of the interaction between already existing elements, which, in turn, operate by certain norms in building the system.

The term *synergy* itself (from the Greek συνεργία Synergos – co-acting) is understood as the combined effect of two or more factors, which combined effect significantly exceeds the effect of each individual component of their sum (Gritsanov, 2003).

## 2. Problem Statement

The concept of *synergy* or *synergistic process* is one of the keys in the theory of the study of the system. For the first time the problem of self-organization of the system within the framework of the term synergetics was arised by the Belgian scientist Haken (1980) in his lectures given in 1969 at the University of Stuttgart.

One of the founders of synergetic research methods is Poincaré (1971), who originated the nonlinear dynamics methods and a qualitative theory of differential equations at the end of the 19th century. It was Poincaré (1971) who introduced the concepts of attractor, bifurcation point, unstable trajectories and dynamic chaos in the three-body problem of celestial mechanics (Earth-Moon-Sun attraction).

According to Budanov (2006), a real breakthrough in understanding of the synergetic processes in various natural and technological phenomena happened precisely in the 60–70s of the twentieth century.

## 3. Research Questions

Today synergetics operates not only in natural and technical fields but also in humanities such as social synergetics, economics, ecology, psychology and pedagogy. It is widely used in linguistics, history and history of art, and even anthropology. It can be stated that synergetics is an interdisciplinary field of science.

From the perspective of new methods in this particular case of the synergetic laws there is nothing original. Today any branch of science asks questions that erase interdisciplinary boundaries because the philosophy of any science is to know the secret, the hidden and the inexplicable picture of the world surrounding us.

The complexity of the synergy analysis, firstly, is that one of the initial conditions for self-organization of nonlinear complex systems is chaos or so-called deterministic chaos. According to Knyazeva and Kurdyumov (1992), synergetics demonstrates the many sides of chaos and the hidden potentials of small fluctuations and accidents. We can agree with the authors' idea that chaos is not always evil and that small and seemingly random things can be of great importance.

The fact that a small disturbance has or may have a global significance for an unstable position has no doubt. However, we believe that something indicating a connection between the micro and macro scales always exists regardless of the state of the environment. Another question is, is this something random and, in general, what is randomness? Even if chaos is determined, then why a small disturbance or an act, that has a global significance on a complex system and determines its further development, cannot be determined?

The result of synergetic processes is the formation of a qualitatively new. The more complex the structure and essence of the new unity, the wider the modelling possibilities, the more difficult it is to determine the way of development of it at the time of bifurcation. However, any system linear or non-linear is limited by the development vectors. Nonlinear systems, despite the seemingly unlimited nature of development, are nevertheless limited by a certain field and practically cannot be predicted at the unstable moment. In our opinion, the question of the emergence of some new structure from the spectrum of possible structures at the unstable moment remains open. The problem is also that synergetic processes are more studied in the natural sciences but the literal transfer to the humanity field may not always have an appropriate result. In this context, Budanov (2016) notes that the task of synergetics is, on the one hand, to avoid the extremes of naive physicalism and reductionism, when natural science models are transferred to the sphere of humanities and, on the other hand, to maintain the constructiveness of the model approach in dialogue with the new reality in new, sometimes uncertain conditions. Budanov's (2006) approach, i.e., preserving the constructiveness of the model approach, was the basis of our study, in which we attempted to model the process of emergence in the language system (Eskov, 2013).

#### **4. Purpose of the Study**

As we noted, the system, being a synergistic mechanism, constructs structural units to provide the subject of the system with an information or activity element. Talking about synergy in the language system, it is firstly necessary to recognize that the language system, unlike other nonlinear systems, has clearly independent elements that are the basis of any form of the language system. These are phonetic, graphic and other semiotic resources, without which it is impossible to build any kind of language system. However, the mere fact of the presence of these elements is not enough to form a language system. The synergy of the linguistic system involves psychological, physiological, physical and other factors that, in the process of correlation, give the result as a text. Accordingly, language as an object of a research is not an identical object for a scientist. In this context, the opinion of Chikobava (1959) is absolutely true, which states that the language in the understanding of the physiologist does not seem to be what it is for a psychologist: each of these sciences, characterizing the language, highlights those moments in the language that correspond to the point of view of this science. The essence of the language in the definition given by the physiologist, therefore, is absolutely different from the essence of the language in the understanding of the psychologist.

Accordingly, the main thing that the researcher needs to pay attention to is the discovery of the components of these systems and their correlations, which, in turn, make it possible to establish at least some regularities in the functioning of synergetic systems. Moreover, as noted by German and Pishalnikova (1999), it is important to remember that the "synergetic effect" as a result of a system of

meanings in the recipient's conceptual system is not equal to the detection of these components in the analysis.

In a language system structural deviation in the text does not always make sense of generative significance. Unlike other nonlinear systems, in which the slightest change in the structure affects the entropy of the entire system and can cause a change in the essence of the system in general. However, the uniqueness of the language system is that the result of synergetic processes in this system can have a multi-valued essence in terms of interpretation of meanings. The synergetic process in the language system is updated by external influence, i.e., speech situation is one of the significant factors in the synergetics of the text (German & Pishalnikova, 1999).

The generation of a semantic unity in the form of a certain text even at the level of a phrase is one of the most controversial and unresolved problems in the self-organization of a text. The idea on the possible primordial meaning in the synergetics of the text put forward by Luria (1998) seems extremely interesting. According to Luria (1998), the question of the origin of a semantic unity can be formulated differently. Instead of asking how the phrases from individual words arise, which leads to its creation, one should ask whether the statement arises from primary thought, which only then turns into a system of words forming a phrase.

According to Gural (2007) synergetic approach to language can be considered from the aspect of functional linguistics, i.e. language can be represented as a communicative system that facilitates the transfer of cultural and historical experience. In this case, the permanent, contextual system of interactions becomes the medium of the language's existence.

The synergetic process that is implemented in the language system always provides the opportunity to choose the evolutionary path, i.e., bifurcation points reveal equivalent attractors that contribute to the development of the situation and the definition of a specific text model, i.e. the implementation of the text in a certain form. Functions of attractors, in turn, according to Moskalchuk (2003), is the narrowing and direction of the functional deployment mode of the unity. It is believed that knowledge of the attractors' positions in the text can reveal not only the processes of self-organization in it, but also explain the hidden reasons for the preference of certain positions of the text in the perception of information of the unity, i.e. a certain form of text. As for the form itself, Moskalchuk (2003) believes that for its analysis it is necessary to identify those elements of the unity that make up the system, establish the features of their integration with each other, and also describe those synergetic integrative processes that are implemented in it. Moskalchuk (2003) defines some elements that contribute to the structural self-organization of the text, the function of which is to maintain a stable mode of the text's functioning. According to Moskalchuk (2003), these elements include: the unity, resulting from the interaction of static and dynamic tendencies of text formation, strong and weak positions in texts, intervals at certain positions, boundaries that are defined in positional slices, attractors and repellers, as well as gradation models manifested in text structures, the task of which is to fix the individual path of a given form to the harmony of multidirectional trends. These include, increasing, decreasing and maintaining the density of cycles in intervals on the way to completeness of form. Thus, identifying the elements of the structural self-organization of the text, Moskalchuk (2003) defines the processes that, in her opinion, contribute to the structural self-organization of the text. Moskalchuk (2003) associates the

cooperative effects of the system that arise between statically understood intervals and attractors to the processes of structural self-organization of a text.

For all the harmony of the hypothesis of ordering self-organization of the text presented by Moskalchuk (2003), in this particular case, the question of the spontaneity of “attractor shifts” and not being controlled by the consciousness of the subject, in our opinion, remains controversial, especially if the author herself emphasizes “general aspiration and orientation in order to reveal the general balance of form”. She admits that the text must have a program (matrix) laid down by the author in the construction of the work. It should regulate reader's perception as an indicator of the fullness of the art form and not the randomness of the structural organization and self-organization of the text. We adhere to the point of view that the very presence of numerous attractors representing various options for the development of the situation and the design of the final version of the text is the potential of the language matrix. It is certainly associated with the mental perception of objective reality and interprets this reality, which is beyond the empirical reach of human consciousness. The presence of a certain orientation, i.e. ideas, is considered in the very context of the work of Moskalchuk (2003). She emphasizes that the balance of form is an indicator of the whole text's harmonic structure which reflects the consistency of all multidirectional trends. It is a moment of a complex development mechanism, including "the presence of a certain order (ordering) of the elements of the unity." Nevertheless, it is believed that the attractor which is supposed to be the most meaningful is put forward by the structural balance of the form and occurs spontaneously. It is assumed that, behind the differences in the form of the unity, there are differences in the semantic and expressive order, which affect a person. These are the indicators of assessing the effectiveness of communication through the text. That is why, according to the author, it is so important to know the localization in the text and the volume of the interpretation field, including attractors with the highest intensity of the synergetic integrative process. Thus, there is a constant interaction processes as a result of which there is a harmony in the form of the text as a compromise for multidirectional factors. Moskalchuk (2003) concludes that the presence of differences in one place contributes to the growth of the dynamics of the form. The striving of the unity structure to balance is noted. Respectively, such an equalization of differences contributes to structural balance, positional accuracy and stability.

As for interactivity, the best example here is texts that, according to Oleshkov (2006), are cognitive representations that manifest themselves in statements with intentionally planned content. Oleshkov (2006) believes that all kinds of options for the evaluation are “samples”. Creation of texts of the corresponding functional-stylistic type is based on this. Based on the general conditions of communication, it consisting of 1) the situation of communication; 2) partners; 3) the purpose of communication; 4) the subject of speech; 5) lack of time. Oleshkov (2006) concludes that there is a certain order in the very process of creating the text in the act of communication. Moreover, the author talks about the probability of creating an “ideal” text, which is the optimal outcome of the process of verbal interaction. At the same time, in the author's opinion, it is necessary to take into account the fact that even in the ideal text created intentionally and literally is transmitted within the framework of the discursive process. It means that some errors are to be objectively observed as abnormal linguistic units, steam and extra-linguistic phenomena, etc. All this leads to an increase in entropy. Thus, according to Oleshkov (2006), if develop the appropriate methodology, we can analyze the effectiveness of

communication at the entropy level. Entropy means a measure of the impossibility of predicting or designating of the text's order, the uncertainty of its development in the discursive process. This development is characterized by the availability of choice to build a subsequent stage from several potential options. The entropy index, according to the author, is a quantitative characteristic of the level of information ordering of a text as a system. The more the level of entropy, the less ordered the text, the more it deviates from the "ideal" development. Thus, according to the hypothesis of Oleshkov (2006), entropy is a function of a state. In any state of the text you can find a certain value and level of entropy. When the entropy in the text reaches its maximum level, we can say that the text has lost its consistency, i.e. lost all signs of the text (Oleshkov, 2006).

Here the question arises, what does the text turn into reaching maximum entropy? In general, is it possible to use the term entropy because the text is an ordered system. In our opinion, the concept of "maximum entropy" in a language is more acceptable when it is not a text but a speech situation that precedes the appearance of a certain interpretation. In the speech situation, in our opinion, deterministic chaos is revealed in which entropy of various levels is visible. We believe that the level of entropy in a speech situation depends on the adequacy of the interpretation of the speech situation, which manifests itself in a version of the text. However, in no case do we deny the existence of entropy in the text and the destruction of the text with increasing entropy.

## **5. Research Methods**

For all the studies above was used comparative method. It is supposed to solve the problem of synergetics in linguistics and seems to be extremely useful, both theoretically and practically.

## **6. Findings**

As a result of the study, it was found that the synergies of the linguistic system involved psychological, physiological, physical, extralinguistic and other factors. Correlating altogether they produce the text as a result.

## **7. Conclusion**

1. The "Synergetic effect" as the result of a system of meanings in the conceptual system of the recipient is not equal to the discovery of these components in the analysis. The "synergistic effect" should be considered as a real psychosomatic process.
2. The synergetic process in the language system is updated by external influence, i.e., speech situation is one of the significant factors in the synergetics of the text.
3. The synergetic process that is implemented in the language system always provides the opportunity to choose the evolutionary path, i.e., bifurcation points reveal equivalent attractors that contribute to the development of the situation and the definition of a specific text model, i.e. the implementation of the text in a certain form.

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