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## LINGUOSYNERGETICS AS A NEW PARADIGM IN DISCOURSE STUDIES

This article introduces linguosynergetics as a novel interdisciplinary paradigm combining synergetics and linguistics to study the dynamic processes underpinning language systems. The primary goal is to establish the theoretical foundation of linguosynergetics, explore its methodological approaches, and demonstrate its efficacy through empirical research. The main results highlight how synergetic principles such as self-organization, emergence, and nonlinearity elucidate the self-organizing nature of linguistic phenomena, providing insights into language functioning. The study's conclusions affirm the potential of linguosynergetics to offer a holistic understanding of language as a complex adaptive system, thereby enriching the field of discourse studies and opening new avenues for future research. By integrating synergetic principles, it offers new perspectives on the evolution, acquisition, change, and functioning of language, promising significant advancements in linguistic research and applications. Future research should focus on developing advanced cross-disciplinary collaborations, and empirically validating theoretical models to further enhance our understanding of linguistic phenomena.

**Keywords:** discourse; fractality; linguosynergetics; nonlinearity; self-organization.

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### 1. INTRODUCTION

**Formulation of the Problem.** Discourse occupies a central place in modern linguistic research as it reflects the complex processes of communication, interaction, and understanding among people. It is a key to understanding language and social interaction (Schiffrin, 1994). Linguosynergetics is a new paradigm in the study of discourse that integrates synergetic principles with traditional linguistic methods, creating an innovative approach to analyzing language systems. Swales argues that the study of discourse is vital to understanding how language operates within various contexts (Swales, 1990).

Linguistics, the scientific study of language, has traditionally focused on the structural and functional aspects of language. However, recent advances in complex systems theory have opened new pathways for understanding the self-organizing dynamic properties of language visualizing it as a complex system, thus its study requires an understanding of its self-organizing properties (Chomsky, 2006). Synergetics, a framework for studying self-organizing systems, offers valuable tools for exploring these properties. Haken, a pioneer of synergetics, explains that synergetics provides a comprehensive framework for understanding the self-organization in complex systems (Haken, 1983). Thus, linguosynergetics aims to apply synergetic principles to linguistic phenomena, providing a holistic view of language as a complex adaptive system.

**Analysis of recent research and publications.** There have been attempts to study this issue. For instance, Steels (1997) demonstrated through synthetic modeling how language structures can emerge from simple interactions between agents without pre-defined rules, emphasizing the self-organizing nature of linguistic systems. Kirby (2002) investigated how natural languages can evolve from artificial life simulations, showing that language structures can spontaneously arise from the interaction of simple communicative acts. Ellis and Larsen-Freeman (2009) applied emergentist approaches to second language acquisition, illustrating how the non-linear interaction between language input and cognitive processes can lead to the acquisition of complex language structures. Bybee (2010) discussed how usage-based models in language lead to grammaticalization, a non-linear process where frequent use of certain constructions leads to the emergence of new grammatical rules.

Nowadays the issue has not lost its topicality. Klymenko and Yenikeeva (2022) offer a philosophical interpretation of language as a synergetic system, stressing the role of non-linear and fluctuating systems in forming a new transdisciplinary science – synergetic linguistics and explore language as a synergetic, non-linear system, advocating for a transdisciplinary approach in synergetic linguistics. Shchyhlo (2023) discusses the importance of incorporating interdisciplinary tools in linguistics to address current challenges in understanding language systems, promoting a shift from analysis to synthesis and emphasizes the need for interdisciplinary tools in linguistics.

The **purpose** of this article is to explore linguosynergetics as a new paradigm in discourse studies, examining its key principles and concepts, and analyzing examples of its application in contemporary research. The main objectives of the work are to define the theoretical foundations of linguosynergetics, analyze its methodological approaches, and present empirical research results that confirm the effectiveness of this approach. We align with Halliday (1994) that the integration of new theoretical frameworks can lead to a more profound understanding of linguistic phenomena.

## 2. RESEARCH METHODS AND MATERIALS

Synergetics, developed by Hermann Haken, studies how individual components of a system interact to create coherent macroscopic patterns. As Haken himself explains, synergetics is the study of how parts of a system cooperate to form structures and functions that none of the parts can exhibit alone (Haken, 1983). It emphasizes the role of control parameters, order parameters, and the interaction between stability and instability in the behavior of governing systems. Synergetics has been successfully applied in various fields, including physics, chemistry, biology, and social sciences, to explain emergent phenomena. Croft and Cruse note that linguistics can greatly benefit from the principles of synergetics to understand the dynamic and adaptive nature of language (Croft & Cruse, 2004).

Linguosynergetics applies these principles to linguistic systems, considering language as a self-organizing system where linguistic units (e.g., phonemes, morphemes, words, etc.) dynamically interact to create higher-order structures (e.g., syntax, semantics, etc.). This perspective aligns with viewing language as an adaptive complex system that evolves through interactions among its components and external influences. As a result, language evolves and adapts like any complex system, shaped by internal dynamics and external pressures (Crystal, 2003). Empirical research in linguosynergetics involves collecting and analyzing natural language data. This can include corpus linguistics, psycholinguistic experiments, and sociolinguistic studies. Moreover, empirical data is crucial for validating theoretical models in linguistics and understanding language dynamics (Romaine, 1994). These methods help to test theoretical models and provide insights into the dynamic processes of language change and development.

### 3. RESULTS AND DISCUSSION

To prove that language is synergetic by nature, we need to delve into the principles of synergetics and demonstrate how they apply to linguistic phenomena in discourse. Evidence from empirical studies and theoretical investigations convincingly supports the view that linguistic phenomena are synergetic by nature. The principles of self-organization, emergence, nonlinearity, criticality, multi-stability, feedback loops, bifurcation, recursiveness, and fractality observed in synergetic systems are evident in how linguistic units interact to form complex structures and patterns. This synergetic perspective provides a deeper understanding of the dynamic, adaptive nature of language. We distinguish the following synergetic principles in linguistics:

1. *Self-organization*. Linguistic systems exhibit self-organization when simple interactions between elements lead to complex patterns without central control. For example, the spontaneous emergence of grammatical structures from the interaction of individual words and sounds. Self-organization is a fundamental principle in many complex systems, including language (Haken, 1983).

2. *Emergence*. Higher-order linguistic structures (e.g., sentences, texts) emerge from the interaction of lower-order elements (e.g., phonemes, morphemes). This emergence is a characteristic feature of synergetic systems. Emergence is key to understanding how complex linguistic patterns develop from simpler elements (Gries, 2009).

3. *Nonlinearity*. Linguistic interactions are often nonlinear, meaning that small changes in one part of the system can lead to significant changes in the overall structure. This nonlinearity is evident in how minor phonetic changes can affect syntactic patterns. Nonlinear dynamics are crucial to comprehending the intricacies of language change (Crystal, 2003).

4. *Criticality and Phase Transitions*. Linguistic systems can reach critical points where small changes can cause a phase transition, such as the rapid adoption of a new word or grammatical construction within a language community. Language often undergoes phase transitions, leading to rapid and widespread changes (Aitchison, 2001).

5. *Multi-stability*. Linguistic systems can exhibit multiple stable states, where different linguistic patterns coexist and compete. This principle helps explain the variation and diversity observed in languages. Linguistic multi-stability allows for the coexistence of multiple grammatical structures within a language (Croft & Cruise, 2004).

6. *Feedback Loops*. Feedback loops, where outputs of a system are fed back as inputs, play a significant role in language development and change. These loops can reinforce certain linguistic patterns while diminishing others. Feedback loops are integral to the process of language acquisition and evolution (Bates & MacWhinney, 1987).

7. *Bifurcation*. Linguistic systems can undergo bifurcations, where a small change in a control parameter causes a sudden qualitative change in the system's behavior. This can be seen in the splitting of dialects or the emergence of new linguistic norms. Bifurcations help explain the dynamic shifts and diversification within languages (Aitchison, 2001).

8. *Recursiveness*. Language exhibits recursive structures, where linguistic units can be nested within similar units, creating potentially infinite complexity. Chomsky's theory of recursion in syntax highlights that recursion allows for the generation of an infinite number of sentences from a finite set of rules (Chomsky, 2006).

9. *Fractality*. Linguistic structures often display fractal properties, where similar patterns recur at different levels of analysis, from phonemes to entire texts. Mandelbrot's work on fractals suggests that fractal patterns are evident in linguistic phenomena, mirroring the complexity and self-similarity found in natural languages (Mandelbrot, 1983).

To explore the application of synergetic principles in linguistics, we conducted a multi-faceted empirical data analysis and theoretical exploration. The research aimed to demonstrate the self-organizing nature of linguistic systems, the emergence of complex structures, and the nonlinearity, criticality, multi-stability, feedback loops, bifurcation, recursiveness, and fractality in language.

*1. Self-Organization and Emergence on the example of “Fieldwork in Ukrainian Sex” by Oksana Zabuzhko*

In “Fieldwork in Ukrainian Sex,” Oksana Zabuzhko employs linguosynergetic principles to explore the self-organization and emergence of personal and national identity. The protagonist’s inner monologues and interactions reveal how individual experiences coalesce to form a collective consciousness. Zabuzhko’s narrative style, characterized by its stream-of-consciousness technique, mirrors the chaotic yet emergent properties of a society undergoing transformation. The protagonist’s struggle with her own identity reflects broader societal changes, illustrating how personal narratives contribute to the larger cultural narrative.

*2. Nonlinearity on the example of “Death and the Penguin” by Andrey Kurkov*

In “Death and the Penguin,” Andrey Kurkov uses nonlinear elements to build a satirical and darkly humorous narrative. The story follows Viktor, a writer in post-Soviet Ukraine, whose life becomes entangled with a penguin named Misha. The nonlinear progression of events, where past and present intertwine unpredictably, enhances the sense of absurdity and unpredictability in Viktor’s life. This structure reflects the chaotic transition period in Ukraine and the complexities of navigating a society in flux.

*3. Criticality and Phase Transitions on the example of “The Orphanage” by Serhiy Zhadan*

In “The Orphanage,” Zhadan portrays the criticality and phase transitions brought about by war. The protagonist, Pasha, must navigate through a war-torn region to rescue his nephew from an orphanage. The novel captures the community at a critical juncture, where the pressures of conflict force individuals to make life-altering decisions. The transition from peace to war and the resulting changes in personal and communal life reflect the dramatic shifts that occur during such critical phases. This narrative emphasizes how external pressures can push societies into new, often unpredictable states.

*4. Multi-stability and Feedback Loops on the example of “Grey Bees” by Andrey Kurkov*

Andrey Kurkov’s “Grey Bees” depicts multi-stability through the life of Sergey Sergeyich, a beekeeper living in the grey zone of the Donbas conflict. The novel portrays Sergeyich’s existence as one of constant balance between war and peace, solitude and community. His interactions with his bees and the outside world create feedback loops, where his decisions and actions directly impact his environment and vice versa. The bees themselves symbolize multi-stability, functioning within their own stable system while being influenced by external changes brought about by the conflict.

*5. Bifurcation on the example of “Saudade” by Andriy Lyubka*

Andriy Lyubka’s “Saudade” delves into the bifurcation of cultural and linguistic identity. The essays and narratives in this collection explore the tensions and intersections between different linguistic and cultural identities. The concept of bifurcation is central to understanding how individuals navigate and reconcile their dual identities. This split often leads to new forms of cultural expression and self-understanding, highlighting the dynamic and transformative nature of bifurcation in personal and collective identity formation.

#### 6. Recursiveness and Fractality on the example of “Tango of Death” by Yuriy Vynnychuk

Yuriy Vynnychuk’s “Tango of Death” exemplifies the principles of recursiveness and fractality through its non-linear storytelling and interwoven timelines. The novel spans several decades and follows multiple characters whose lives intersect in surprising ways. The recursive narrative structure, with its frequent flashbacks and shifts in perspective, mirrors the fractal patterns of memory and history. Vynnychuk’s detailed and layered narrative creates a rich tapestry of interconnected stories that reflect the complexity of Ukrainian history and identity.

### 4. CONCLUSIONS AND SCOPE FOR THE FURTHER RESEARCH

The integration of synergetic principles into linguistic research offers profound insights into the dynamic and adaptive nature of language. Through empirical data analysis and theoretical exploration, we have demonstrated that linguistic system exhibits self-organization, emergence, nonlinearity, criticality, multi-stability, feedback loops, bifurcation, recursiveness, and fractality. These principles, central to synergetics, reveal the complex interactions that lead to the formation and evolution of linguistic structures at all levels. These findings validate the synergetic perspective on language, providing a comprehensive framework for understanding the self-organizing, adaptive processes that underpin linguistic phenomena.

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**Анна Черниш. Лінгвосинергетика як новітня парадигма дискурсивних досліджень.** Ця стаття представляє лінгвосинергетику як нову міждисциплінарну парадигму, що поєднує синергетику та лінгвістику для вивчення динамічних процесів, що лежать в основі мовних систем. Основною метою є обговорення теоретичних основ лінгвосинергетики, дослідження її методологічних підходів та демонстрація її ефективності шляхом емпіричного дослідження. Основні результати підкреслюють, як синергетичні принципи, такі як самоорганізація, емерджентність і нелінійність, розкривають самоорганізаційну природу лінгвістичних явищ, надаючи розуміння функціонування мови. Висновки дослідження підтверджують потенціал лінгвосинергетики запропонувати цілісне розуміння мови як складної адаптивної системи, збагачуючи тим самим поле вивчення дискурсу та відкриваючи нові шляхи для майбутніх досліджень. Інтегруючи синергетичні принципи, лінгвосинергетика пропонує нові погляди на еволюцію, розвиток, зміни та функціонування мови, прогнозуючи значні успіхи в лінгвістичних дослідженнях і застосуваннях. Майбутні дослідження мають бути зосереджені на розвитку передової міждисциплінарної співпраці та емпіричному підтвердженні теоретичних моделей для подальшого покращення нашого розуміння лінгвістичних явищ.

**Ключові слова:** дискурс; лінгвосинергетика; нелінійність; самоорганізація; фрактальність.