ЛИНГВИСТИКА / LINGUISTICS / ЛИНГВИСТИКА

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Research article

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BIFURCATION AS A SELF-REGULATING PHENOMENON OF THE LANGUAGE SYSTEM

Abstract. This research paper explores one of the fundamental principles of synergetics — the concept of bifurcation, its essence, and functional role. The main objective of the study is to reveal the nature of bifurcation as a key factor in the formation of synergetic phenomena. The tasks of the research are planned to be achieved by identifying the general essence of the bifurcation phenomenon in synergetics, describing its manifestation in linguistics, and analyzing its function through linguistic evidence. Although the synergetic paradigm (including linguistic synergetics) has become a global trend in various areas of general education, the conceptual foundations of synergetic phenomena have not yet been thoroughly examined. Therefore, this article represents one of the first attempts to define and interpret the term «bifurcation» in linguistics, including its application to the Kazakh language through specific examples and linguistic data.

Theoretical findings contribute to a deeper understanding of the dynamic nature of language systems, including the Kazakh language. The practical relevance of the study lies in enhancing communication between speakers and improving their linguistic competence. The results may be useful for philology students during lectures, seminars, and practical sessions.

Keywords: bifurcation, synergetics, linguosynergetics, language system, polysemy, word meaning.

Introduction

It is well known that language, which has existed alongside humanity since ancient times, plays a crucial role in fulfilling a wide range of material, spiritual, and cultural needs of human life. With its long history, language has evolved alongside human development. As human beings progress, so does the language that serves them. For the Kazakh people, who have particularly valued the power and essence of words, language serves not only communicative (tool for communication) and cognitive (tool for cognition) purposes but also expressive (tool for expressing thoughts), constructive (tool for thinking), and accumulative (tool for acquiring experience and knowledge) functions, all of which are considered valuable. The development, growth, and culture of mankind, as well as the accumulation of life experiences and skills through education, are made possible through language, which exists with humanity in an open, self-regulating, self-organizing, and adaptive manner. For any phenomenon in society to survive, maintain its form, and continue existing, it must exhibit some form of activity. Contemporary linguists are exploring this property of language within a new paradigm, the phenomenon known as synergetics.

Thus, what is the phenomenon of bifurcation, which is a forming factor in synergetics (the science that studies the self-regulation of complex systems in various fields, specifically the mechanism of self-organization of phenomena in open systems, and the interrelated and cooperative actions of the components that form a unique structure)? What role does it play in linguistics? What factors contribute to the changes in the general language system?

Bifurcation is a Latin word, "bifurcus," meaning division or branching. It refers to the splitting of development paths from a state of equilibrium in an open and complex system, resulting in a shift towards a new quality under the influence of movements within the dynamic system (not due to a strong movement that radically alters the system).

When a system is subjected to external and internal changes, i.e., when its parameters exceed certain threshold values, its development mode changes qualitatively. It adapts to any external forces, and a different tendency of self-structuring and self-organization comes into play.

The theory of bifurcation was founded by French mathematician-physicist A. Poincaré and Russian mathematician-mechanic A. Lyapunov (Khan, M. A. and Jeoti, V., 2013). Modified chaotic tent map with improved robust region. 2013 IEEE 11th Malaysia International Conference on Communications (MICC), 496-499. https://doi.org/10.1109/micc.2013.6805880). Their research suggests that the phenomenon of bifurcation greatly simplifies the study of real physical systems (Livina, V. (2023). Tipping point analysis and its applications. https://doi.org/10.47120/npl.ms47), particularly in predicting the nature of new movements arising during transitions to a different state, assessing their stability, and evaluating the quality of life.

Initially observed in natural sciences, bifurcation gradually became a foundational concept in the study of other fields, including medicine, psychology, and philosophy.

In linguistics, bifurcation, along with the concept of synergetics, has now been introduced and studied within the framework of linguosynergetics.

Thus, *the term bifurcation in the language system* is understood *as the division of linguistic units into two due to the influence of certain factors.* The bifurcation phenomenon can be viewed as a process in which linguistic structures shift in response to external or internal factors, leading to a qualitative change in language. **The significance of bifurcation in linguistics lies in defining language norms and rules and in the study of language change.** This is because language changes, in which its components shift from one state to another (e.g.,

grammar, lexicon, phonetics), are often a response to changes in the socio-cultural environment and cognitive factors. This is especially true for migration, globalization, urbanization, new technological advancements, digital space, and international cultural exchanges. The growth of social media particularly contributes to rapid language change, as users adapt their language to new communicative contexts.

However, a number of linguists emphasize that the most significant factor influencing the change in a language system is the social and domestic factor, which is seen as the "living" phenomenon of language change.

Thus, first of all, let us systematize the factors that drive and influence the change in the language system. The change in the state or form of a language is affected by both internal linguistic and external factors, with the external factors being referred to as extralinguistic factors in linguistics. The influence of external factors is primarily seen in the lexical field of the language.

Let us first outline the external objective factors that affect the language from beyond the human mind and the domain of language:
- Historical factor
- Geographical factor.
- Time factor.
- Ethnic factor.
- Social factor.
- Political factor.
- Cultural factor.
- Media factor.
- Demographic factor.
- Digital space.

As for the subjective factors related to human conscious activity:

1. Social-psychological factor – the level of understanding and use of the distinctiveness and individuality of one's native language by the population, i.e., ethnic groups, and their respect for their language. This includes the residents' linguistic awareness, attitude towards the state language, and their stance on it.

2. Pedagogical factor, related to the preparation of language specialists – the preparation of teaching staff for the state and other languages within the country, implementing state-level initiatives for language development, and preparing language specialists through master's, doctoral, and post-doctoral programs.

3. Political factor or language policy – language policy refers to the system of political, social, and sociolinguistic measures implemented by the state and public organizations, aimed at improving or stabilizing the linguistic situation in society and revitalizing national interests.

4. Personal factor – groups of words arising due to an individual's understanding and capabilities.

The above-mentioned objective and subjective factors influence the development of the language in varying degrees across different regions of our country.

Internal changes are influenced by phonetic, grammatical, lexical factors, and internal linguistic factors such as meaning "generation," economy, compression, transformation, and others. The vocabulary of the Kazakh language also follows the synergetic laws of language, establishing order when necessary, adhering to its own rules. For instance, during the

development of a language, the naming, specification, and unification of related concepts, as well as giving distinct and independent names to parts or aspects of concepts, may require the modification, renewal, and clarification of certain terms. As a result, the system undergoes changes due to its self-regulation ability.

Therefore, the phenomenon of bifurcation in linguistics describes the change in the linguistic state or structure caused by various factors, specifically the splitting of one concept into two, the divergence of word meanings, and the emergence of a new semantic meaning.

The study of this concept is crucial to understanding how and why linguistic changes occur.

Materials and Methods

Among domestic researchers, one of the first to explain this concept was A.K. Kairzhanov, who writes: "The bifurcation point is the 'overheating' of the system, the critical tension that may arise, for example, due to the intrusion of xenologisms or the occasional connotation of the lexical system, i.e., due to dissipation" (Kairzhanov, 2007). Without considering the laws of dissipation, the development of the language system leads to a deadlock, causing chaos. In Kazakh linguistics, J.A. Mankeva, who was one of the first to write about the science of synergetics, explains: "This phenomenon causes 'state change' (bifurcation) in the system" (Mankeva, 2021). Foreign scholars, in their study of the manifestation of this concept in linguistics, state that "Bifurcation in linguistics is a pivotal concept that elucidates the dynamics of language change, particularly in understanding how and why languages evolve. The notion of bifurcation refers to a critical point where a system transitions from one stable state to another, which can be observed in various linguistic phenomena" (Sonderegger, M. and Niyogi, P. (2013). Variation and change in English noun/verb pair stress: data and dynamical systems models. Origins of Sound Change, 262-284. https://doi.org/10.1093/acprof:oso/9780199573745.003.0013) (Sonderegger, 2013).

Summing up the research of these authors, it should be noted that the definition of the bifurcation pattern is a worldwide methodological tool for learning language as a self-organizing system. This area also opens up new opportunities for understanding language processes and their use in communication with cultural and sociological aspects.

Together with the works of domestic scientists on the topic of research, monographs, scientific studies and articles by foreign linguists were collected, compared with Kazakh linguistics, analyzed, and summarized specific facts from the works of classical writers. As a result of sorting and analyzing these materials and facts, we have made theoretical assumptions. To achieve the purpose of the research, theoretical assumptions were analyzed with the help of linguistic evidence, and a linguistic analysis was carried out. Along with traditional descriptions, comparative, historical and comparative methods were preferred in the study, as well as classification and refinement methods. Using the historical and comparative method, it is proven that the language system is a synergetic phenomenon as a result of changes, ways of language development, patterns of its change and recognition of language as a developing and changing historical phenomenon.

Discussion and Results

Linguosynergetics examines the self-organizing and self-regulating phenomena of language, while the bifurcation phenomenon, which shapes these laws, describes the splitting of linguistic units into two, the expansion, change, transition, and transformation of word meanings.

When discussing the separation of word meanings, it is important to first distinguish it from polysemy and homonymy, to avoid confusion, by clarifying the differences in meaning, form, and characteristics of these terms.

Words that are used in multiple senses beyond their primary meaning are known as ***polysemous words, i.e., polysemy.*** The primary (main, direct) meaning of a word and its derived (secondary, figurative) meaning are determined by context, the specific situation, and the general theme of the conversation. However, when distinguishing between meanings, the primary meaning is not always directly dependent on the context. The semantic connection between word meanings is revealed through the common elements they share, which is expressed by the role of the seme. The richness and development level of a language are measured not only by the number of words in its lexicon but also by the richness of those words. This is the key indicator of the developed quality of words and is a characteristic of the core vocabulary. Initially, words in the lexicon had few meanings. Later, they acquired one or more additional derived meanings, due to factors such as the similarity of objects, their proximity, or the shift from whole to part or part to whole.

Polysemous words come from a single part of speech and derive from a common root. For example, consider the word keñ (wide):

1. Ken (Keñ) – large, spacious, wide room.
2. Ken (Keñ) – more than necessary, not narrow, a wide-cut dress.
3. Ken (Keñ) – generous, open-handed, a generous person.

Similarly, the word otkir (otkır) - sharp appears in the phrases otkir pyshaq (otkır pıshağ) - sharp knife, otkir adam (otkır adam) - sharp person, otkir koz (otkır köz)- sharp eyes, otkir til (otkır til)- sharp tongue, otkir soz (otkır söz) - sharp word, all within one part of speech.

On the other hand, homonyms are completely different words, both in terms of origin and meaning, and they belong to different parts of speech. Homonyms are a group of words with identical external forms but distinct meanings, and their meanings are revealed only through context. Their similarity could be accidental or the result of phonetic changes in the language, or it could arise when new words are introduced from other languages.

For example:

At – workhorse, At – name, title, At – verb (imperative mood).

Thus, over time, the splitting of word meanings into distinct forms is an example of the bifurcation phenomenon, as defined earlier. Generally, the ability of a root or base to give a new meaning without undergoing morphological change is a characteristic of Turkic languages. This semantic development of roots leads to the creation of new words by the conversion method, which occurs when some words lose or weaken their original meaning and enter another part of speech. This type of change in word meaning is referred to in recent scientific works as the transpositional, transformational, or conversion method. However, the most commonly used term in Kazakh is conversion. "Conversion" (from English) refers to the process where "words do not undergo morphological changes but acquire secondary meanings as a result of semantic development" (Salkynbay, 2000).

Although the word acquires a new meaning, the semantic connection with its original meaning is preserved. Scholar S. Isayev writes: "The peculiarity of the conversion method lies in that it involves the connection of words with new meanings, their usage in combination with new words, and the process of undergoing semantic change during speech. Therefore, it also includes processes like substantivization (becoming a noun), adjectivization (becoming an

adjective), adverbialization (becoming an adverb), pronominalization (becoming a pronoun), and verbalization (becoming a verb). The conversion method can create new meanings not only from the primary root but also from derived roots and even words in grammatical forms" (Isayev, 1998). Foreign scholars make the following conclusion: "The phenomenon of conversion in linguistics, often called zero derivation, involves a process through which a word changes its grammatical category without any morphological changes, illustrating the dynamic nature of language and emphasizing its capacity for adaptation and innovation" (Velasco, D. G. (2009). Conversion in English and its implications for functional discourse grammar. Lingua, 119(8), 1164-1185. https://doi.org/10.1016/j.lingua.2007.12.006) (Velasco, 2009)

A group of words undergoing such bifurcation includes verbs in the form of a closed action, which, as instruments to carry out the action, turn into new words. For example: egeu (egeu)-file, zhalgau (jalǧau) - to attach, shanshu (şanshu) - to stab, shashu (şashu)- to scatter, zhazu (jazu)-to write, syzu (sızu)-to draw, auru (auru)-disease, tusau (tusaü)-to bind, sailau (saylau)-to elect, zhudeu (jüdäu) - to wither, qatu (qatü)- to freeze, biteu (bıteü) to close, oqu (oqu)- to study, baiqau (baıqau)- to notice, qosu (qosu)-to add, kobeitu (köbeytu) - to increase, alu (alu)- to take, (bolu) bölü - to divide, zhylu (jılu)- to warm, zhikteu (jıkteü)- to classify, septeu (septü)- to decline, teneu (teñeu)- to compare, qorshau (qorşau) - to surround, qashau (qaşau) - to carve, zhamau (jamau) - to patch, zharau (jaraü)- to heal, zhasau (jasau)- to make, sabau (sabau)- to beat, kosheu (köseü)- to stir, zhabu (jabu) to close, zhalau (jalau) - flag, oyu (oyu)- to carve, ashu (aşu) to open.

Now let's explore the factors behind the second meaning, namely the bifurcation phenomenon. The emergence of words like egeu, şanshu, şashu, tusaü, qatü, bıteü, baıqau, jüdäu, jılu, sabau, jamau, jaraü, jasau, köseü, jabu, jalau, oyu, jılu can be influenced by socio-domestic factors, while the words jalǧau, jazu, sızu, oqu, qosu, köbeytu, alu, bölü, jıkteü, septü, teñeu are clearly influenced by educational and scientific factors.

The next set of words, **created through a common action form**, has transformed over time, through the substantivization of the action, into words with new meanings. For example: aitys (aytıs) - debate, jarys (jaryş) - competition, tabıs (tabys) - profit, shabys (şabıs) - attack,

qyrqys (qırqıs) - battle, urıs (urıs) - fight, tanys (tanıs) - acquaintance, alys (alys) - purchase, beris (berıs) - transaction, talas (talas) - dispute, bolys (bolıs) - partition, qatynas (qatınas) - relationship, bailanys (baylanıs) - connection, sogys (soǧıs) - war, kures (küres) - struggle, zhenis (jeñıs) - victory, ores (öres) - field, jarys (jaryş) - race, atys (atış) - shooting, kiris (kiriş) - income, shygys (şıǧıs) - exit/expense;

Some of these words (soǧıs, küres, jeñıs, şabıs, qırqıs, urıs, atys, talas) are influenced by the historical factor of wartime, while others (alıs, berıs, kiriş, şıǧıs) are shaped by social factors.

Another group **of such words includes those that are written identically but pronounced differently due to a shift in stres**s, resulting in different meanings and word forms. Such words are also referred to as homographs in Kazakh. **These words primarily form pairs consisting of nouns and the negative form of verbs**. For example: *tartpa (noun), tartpa (verb) - to stop (noun), to stop (verb), bölme (noun), bölme (verb) - division (noun), to divide (verb), alma (noun), alma (verb) - apple (noun), to take (verb), şıǧarma (noun), şıǧarma (verb) - exit (noun), to exit (verb), şapma (noun), şapma (verb) - hit (noun), to hit (verb), qoıma (noun), qoıma (verb) - storage (noun), to store (verb), jayma (noun), jayma (verb) - disorder (noun), to disorder (verb), körme (noun), körme (verb) - vision (noun), to see (verb), kespe (noun), kespe (verb) - cut (noun), to cut (verb), salma (noun), salma (verb) - weight (noun), to weigh (verb), ainalma (noun), ainalma (verb) - rotation (noun), to rotate (verb),* It is clear that the bifurcation phenomenon here is influenced by social factors.

The next group of words, *like şala (social factor), sür (social factor), toi (social factor), tasımal (science-education), jurnağ (science-education), jelik (social factor), jalaq (social factor), köşir (historical factor), aşıq (social factor), qayrat (knife-strength, loanword), qıdır (loanword), bırlıq (social factor),* have also been split into two meanings due to the bifurcation phenomenon.

Conclusion

In conclusion, the concept of bifurcation in linguistics encompasses a range of phenomena that demonstrate the dynamic nature of language and its evolution. Bifurcation allows for the study of the complexity of language change and the factors that drive it, from phonetic changes to sociolinguistic identity, as evidenced in the linguistic phenomena discussed above.

Thus, the phenomenon of bifurcation in linguistic studies can be viewed as a complex process involving the interaction of various factors that lead to qualitative changes in linguistic tools. It includes the theory of driving systems, which opens up new opportunities for studying linguistic changes and their concepts.

One of the key aspects of bifurcation in linguistic knowledge is the self-regulating nature of the linguistic system. Language does not exist in a vacuum; it is not a rigid and static system, but rather interacts actively with culture and society.

Therefore, the phenomenon of bifurcation in linguistics can be understood as a complex and multifaceted process involving the interaction of various factors that influence the language system. This phenomenon generates the dynamics of language and its ability to adapt to changes in its environment, making it an essential object of study in modern linguistic sciences.

Thus, bifurcation in language is not merely a lexical or grammatical change; it is a complex process that also encompasses social, cultural, and cognitive aspects. It is an important phenomenon that serves as a mechanism for understanding the relevance of linguistic changes.

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Бифуркация тіл жүйесінің өзін-өзі реттеуші құбылысы ретінде

Аңдатпа. Зерттеу жұмысы синергетика құбылыстарының бірі – **бифуркация** ұғымына, оның мәні мен атқаратын қызметін анықтауға арналады. Мақаланың басты мақсаты – синергиялық құбылыс түзуші факторлардың бірі бифуркация мәнін ашу. Синергетиканың бифуркация құбылысының жалпы мәнін анықтау, оның лингвистикадағы көрінісін сипаттау және бифуркация ұғымының тілдік айғақтар негізінде жүзеге асатын қызметін талдау арқылы зерттеудің негізгі мақсатына қол жеткізу жоспарлануда. Жалпы білімнің қай саласында болмасын қолданылып жүрген синергетика парадигмасын тіл білімі тұрғысынан да қарастыру (лингвосинергетика) әлемдік тенденцияға айналғанымен, қазақ тіл синергиялық құбылыс түзуші ұғымдарға жекелей талдау жасалған жоқ. Сондықтан да мақала бифуркация терминінің тіл білімінде қолданылу маңызын, қазақ тіліндегі көрінісін нақты мысалдармен, тілдік айғақтармен ашып көрсететін алғашқы жұмыс болмақ. Зерттеудің теориялық қорытындысы жалпы тіл жүйесіндегі, оның ішінде қазақ тілі жүйесінің, оны құраушы тілдік бірліктердің өзгермелі сипатын анықтауда үлес қосса, практикалық мәні коммуникатор мен коммуникант арасындағы тілдік қарым-қатынасты түсінуге, реттеуге, жақсартуға, сондай-ақ олардың лингвистикалық құзыреттіліктерін арттыруға үлес қосары анық. Зерттеу нәтижесі филология факультетінің білім алушыларына дәрістер мен семинарлар, практикалық сабақтар өткізу кезінде қолдану мүмкіндігінен көрінеді.

Түйін сөздер: бифуркация, синергетика, лингвосинергетика, тілдік жүйе, полисемия, сөз мағынасы.

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Бифуркация как саморегулирующееся явление языковой системы

Аннотация. Данная исследовательская работа посвящена одному из ключевых принципов синергетики — понятию бифуркации, его сущности и функциональной

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101

роли. Основная цель статьи — выявить природу бифуркации как одного из факторов, формирующих синергетическое явление. Основные задачи исследования планируется к достижению через выявление общей сущности феномена бифуркации в синергетике, описание его проявления в лингвистике и анализ функции понятия бифуркации на основе языковых фактов. Несмотря на то, что парадигма синергетики (в частности, лингвосинергетики) получила широкое распространение в различных областях общего образования, комплексный анализ понятий, лежащих в основе синергетического явления, до настоящего времени не проводился. В этом контексте данная статья представляет собой первую попытку осмысления значения термина «бифуркация» в языкознании, включая его интерпретацию на материале казахского языка с использованием конкретных примеров и языковых свидетельств. Теоретические выводы исследования способствуют более глубокому пониманию изменчивости природы языковых систем, в том числе системы казахского языка и входящих в неё языковых единиц. Практическая значимость работы заключается в возможности применения полученных результатов для улучшения языковых взаимодействий между коммуникатором и коммуникантом, а также в повышении их лингвистической компетенции. Результаты исследования могут быть полезны студентам филологических факультетов при проведении лекций, семинаров и практических занятий.

Ключевые слова: бифуркация, синергетика, лингвосинергетика, языковая система, многозначность, значение слова.

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