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MAIN SCIENTIFIC APPROACHES TO THE STUDY OF TEMPORALITY

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Abstract: This article examines and analyzes the main scientific approaches to research in the category of temporality in linguistics. A systematic review and critical evaluation of functional, cognitive, formal, typological, discourse, and pragmatic approaches to the study of time in language is conducted. For each approach, its theoretical foundations, methodological features, strengths, and limitations are identified. It is demonstrated how different approaches complement one another and contribute to a more complete understanding of the nature and mechanisms of expressing temporal relations. Special attention is paid to the possibilities of integrating different methodological perspectives to create a comprehensive description of temporality as a multi-level and multi-faceted linguistic phenomenon. Using examples from Russian, English, and Uzbek, it is shown how the application of different approaches allows one to identify various aspects of the organization and functioning of the temporal system in specific languages.

Keywords: temporality, scientific approaches, functional grammar, cognitive linguistics, formal semantics, typological analysis, discourse analysis, pragmatics, language system.

Introduction

The study of the category of time (temporality) in linguistics has a long history and is one of the central problems of linguistics. In the course of the development of linguistic science, various approaches to research on how languages express temporal relations and how they structure the representation of time have been developed. Each of these approaches is based on certain theoretical assumptions about the nature of language, about what is the subject of study, and what methods are most effective for investigating linguistic phenomena. An important recognition in modern linguistics is that an unambiguous and exhaustive explanation of the phenomenon of temporality cannot be achieved within the framework of any single approach. Instead, different methodological perspectives illuminate different aspects of this complex phenomenon. The functional approach, for example, makes it possible to identify the communicative functions of temporal forms; the cognitive approach reveals how the human mind structures the representation of time; the formal approach provides precise and rigorous description of the logical structure of temporal systems; the typological approach reveals both universal and unique features of expressing time in different languages. The relevance of this research is determined by the need for a deeper understanding of what approaches exist, what their essence is, what results they have yielded, and how they can be combined to obtain a more complete understanding of temporality.

Literature Review and Analysis of Approaches

The history of scientific research into temporality in language can be conditionally divided into several stages, each of which was connected with the development of new methodological approaches and new conceptual frameworks. Traditional linguistics, which has its roots in classical Greek logic and grammar, focused primarily on morphological description of temporal forms of the verb. In this paradigm, time was viewed first and foremost as a grammatical category expressed by morphological means, and research was reduced to an inventory of verbal forms and description of their formal

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characteristics. However, such an approach proved insufficient to fully explain how languages express temporal relations, since it ignored the role of syntactic and lexical means, as well as the discourse and pragmatic contexts of temporal form use.

The functional approach to the study of temporality, developed in the second half of the 20th century (Bondarko, 1987, 1990; Paducheva, 1996), represents a qualitative shift in research methodology. Within this approach, the time category is viewed not simply as a set of grammatical forms, but as a functional-semantic field uniting means at various language levels—morphological, syntactic, lexical, and discourse. A key tenet of the functional approach is the idea that one and the same function (in this case, the expression of temporal relations) can be realized by various means, and conversely, one form can perform several functions depending on context (Bondarko, 1987). This allows the language system to be viewed as dynamic and flexible, capable of adapting to diverse communicative needs. The functional approach also pays significant attention to context and discourse practice, recognizing that the meaning and function of linguistic units cannot be fully understood without accounting for their use in actual communication.

The cognitive approach to the study of temporality emerged in the last decades of the 20th century with the development of cognitive linguistics (Lakoff & Johnson, 1980; Langacker, 1987; Evans, 2004; Fauconnier, 1994). This approach is based on the assumption that linguistic structures reflect universal cognitive processes inherent in the human mind. According to this perspective, the ways in which different languages express time are a manifestation of deeper cognitive structures that determine how people perceive and conceptualize time. Within the cognitive approach, special attention is paid to metaphor as a fundamental tool of thought. The well-known concept holds that time is metaphorically structured through space—people speak of "movement through time," "the past behind us," "the future ahead of us." These metaphorical models are not random or arbitrary; they reflect deep patterns in human perception based on our physical interaction with the world (Lakoff & Johnson, 1980). The cognitive approach helps explain why certain ways of expressing time seem natural and intuitive to native speakers, while others require conscious effort.

The formal approach to the study of temporality, traceable to the tradition of logico-semantic analysis (Reichenbach, 1947; Montague, 1970; Kamp & Reyle, 1993), focuses on the development of precise, rigorous models of expressing time in language. Within this approach, the system of expressing time in language is analyzed using the formal apparatus of mathematical logic, particularly predicate logic and temporal logic. The formal approach makes it possible to create precise definitions and reveal logical relations between different temporal constructions. For example, Reichenbach's system with its three temporal points (Point of Event, Point of Speech, Point of Reference) makes it possible to formally describe the full range of temporal forms in languages (Reichenbach, 1947). Although the formal approach is sometimes criticized for its abstraction and detachment from actual language use, it provides necessary precision and makes it possible to develop rigorous computational models of language, which has direct application in natural language processing and machine translation (Kamp & Reyle, 1993).

The typological approach to the study of temporality (Comrie, 1985; Dahl, 1985; Whaley, 1997) is based on broad comparative analysis of ways of expressing time in languages of the world. This approach aims to identify both universal patterns that manifest themselves in the vast majority of languages and specific characteristics of individual languages or groups of languages. Typological analysis makes it possible to answer questions about which ways of expressing time are most widespread in the world, whether there are constraints on what temporal systems can arise in a language, and how the historical development of temporal systems occurs. Through typological research, it has been revealed that although languages of the world demonstrate enormous diversity in

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ways of expressing time, there are certain recurrent patterns and regularities (Comrie, 1985). For example, nearly all languages of the world have a distinction between past and non-past tense, although the degree of detail in these distinctions can vary. The typological approach also helps understand how languages organize the expression of time in relation to other categories, such as modality and aspect.

The discourse approach to the study of temporality (van Dijk, 1977; Schiffrin, 1994; Labov & Waletzky, 1997) focuses on how temporal forms are used in real texts and communicative situations. This approach recognizes that the meaning and function of temporal forms cannot be fully understood through analysis of individual sentences; it is necessary to examine whole discourse sequences and how temporal forms organize narrative and structure narration. Within the discourse approach, it has been revealed that there are certain patterns in the use of temporal forms in different types of discourse: in scientific articles, literary texts, oral speech, news, etc. For example, in narrative discourse, the phenomenon of "tense shift" is observed, when the narrator transitions from one temporal form to another to achieve particular pragmatic effects, such as creating a vivid description of events (Labov & Waletzky, 1997). The discourse approach also makes it possible to understand how temporal forms interact with other means of text cohesion to ensure its coherence.

The pragmatic approach to the study of temporality (Levinson, 1983; Austin, 1962; Searle, 1969) focuses on how temporal forms are used to achieve communicative goals and how their interpretation depends on the context of utterance. Within this approach, it is recognized that the meaning of a temporal form is not exhausted by its grammatical or semantic meaning; it is also necessary to account for pragmatic context, including the knowledge of communicators, the goals of the utterance, and background assumptions. For example, the simple present tense form in English, which is traditionally described as expressing present time, can be used to express future time in certain contexts: "The train leaves at five o'clock" can be used as a description of future train schedule. The pragmatic approach also investigates phenomena such as implicature and speech acts connected with the use of temporal forms.

Research Methodology

This article is based on the methodology of comparative analysis of different scientific approaches to the study of temporality. The research includes a critical review of literature on each of the main approaches, analysis of their theoretical premises, methodological tools, and the results obtained. To illustrate the features of each approach, examples from Russian, English, and Uzbek are used, which were selected to demonstrate both universal and language-specific aspects of expressing time. In analyzing each approach, the following parameters are considered: the historical roots and development of the approach; main theoretical premises; the main object of study and levels of analysis; methodological tools and procedures; typical results and contribution to language theory; strengths and limitations of the approach; interaction with other approaches. The research also includes analysis of the possibilities for integrating different approaches and what synergies can be achieved by combining their strengths.

Discussion: Comparative Analysis of Main Approaches

The functional approach provides a powerful tool for analyzing how different linguistic means interact to express one and the same meaning. Let us consider an example from Russian of expressing future time. In Russian, a future action can be expressed in several ways: by the synthetic form of the perfective aspect (budu pisat' — I will write), by the analytic form (budu pisat' pis'mo zavtra — I will be writing a letter tomorrow), and even by the present tense of the imperfective aspect in certain contexts (Ya pishu eto pis'mo zavtra pri znachenii plana — I write this letter tomorrow with the meaning of a plan). The functional approach makes it possible to view all these forms as members of

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one functional-semantic field of future time, where each form has its own functional characteristics and is used in particular contexts. The synthetic form is typically used to express intention or prediction (Ya napishu pis'mo zavtra — I will write a letter tomorrow), the analytic form emphasizes process (Ya budu pisat' pis'mo zavtra — I will be writing a letter tomorrow with indication of process), and the present tense form is used in expressing a plan (Ya pishu pis'mo zavtra — I am writing a letter tomorrow, meaning it is planned). The functional approach also makes it possible to examine phenomena of inter-level interaction, where lexical units (such as temporal adverbs "zavtra" — tomorrow, "vskore" — soon) interact with morphological forms to clarify and specify the temporal meaning.

In English, the functional approach reveals interesting differences in the organization of the temporal system. English future time is not expressed morphologically but analytically through the auxiliary verb "will" or the periphrastic construction "be going to." This difference between Russian (synthetic future) and English (analytic future) reflects a fundamental typological distinction between them. The functional approach makes it possible to understand that despite this formal difference, both systems are functionally equivalent in their ability to express temporal relations. However, the different analytic constructions in English have different functions: "will" is often used to express predictions and spontaneous decisions (I will help you), while "be going to" is often used to express plans and intentions (I am going to write a letter tomorrow). The English perfect (have written) performs a specific function of linking a past event to the present moment, which is reflected in its name "present perfect"—a form that links past time to the present.

Uzbek, as an agglutinative language, demonstrates other ways of organizing the functional-semantic field of time. Future time in Uzbek can be expressed synthetically (*rahbar hisobotni tekshiradi* — the manager will check the report) or periphrastically with the help of a construction *ajotgan* + verb (*rahbar hisobotni tekshirajotgan* — the manager will be checking the report). The functional distinction between these two forms in Uzbek is connected with aspectuality: the synthetic form is often used to express usual, regular actions in the future, while the periphrastic construction emphasizes the processual nature of the future action. The functional approach makes it possible to reveal these subtle differences in the use of forms that might be overlooked in a purely morphological description.

The cognitive approach to studying temporality focuses on how the human mind conceptualizes time. One of the key discoveries of cognitive linguistics is that time, being an abstract concept that is not directly perceived by the senses, is understood through metaphors based on more concrete and physically tangible aspects of experience. As Lakoff and Johnson (1980) note, time is understood through space: the future is ahead of us, the past is behind us, we move through time. This metaphor is so natural for speakers of Western languages that it seems simply a description of reality. However, the cognitive approach shows that this is not a universal feature of all languages. For example, in some cultures and languages the orientation may be different: for the Aymara people (a language of South America), the past is in front (because we can "see" the past in historical records), and the future is behind (because we cannot see it) (Nuñez & Sweetser, 2006).

In Russian, English, and Uzbek, the dominant Western metaphorical model is "time as space," where movement occurs forward through time. However, cognitive analysis reveals interesting differences in the details of this metaphor. In Russian, expressions such as "*idti v budushcheye*" (go into the future) and "*obrashchat'sya v proshloe*" (turn back to the past) are used, which emphasize the active movement of the observer through time. In English, both expressions where the observer moves (we're moving toward the future) and expressions where time moves past the observer (the holidays are coming up, the summer has passed) are found. In Uzbek, similar metaphorical models are found

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(*kelajakka borish* — go into the future, *o'tmisga qaytarish* — return to the past). The cognitive approach allows deeper understanding of the connection between language and culture, showing that the ways of expressing time in language reflect fundamental ways in which people perceive and organize their experience through time.

The cognitive approach also reveals the role of so-called "source domains" in metaphorical extension of temporal vocabulary. For example, in Russian, the word "techeniye" (flow) is used in expressions like "*techeniye vremeni*" (the flow of time), metaphorically representing time as flowing liquid. Similarly in English "flow of time," in Uzbek "*vaqtning oqishi*" (the flow of time). These metaphors are not random; they are based on the universal human experience of observing physical flow (for example, the flow of a river), which is transferred to the more abstract concept of time.

The formal approach to studying temporality provides rigorous, precise definitions and makes it possible to create computational models of language. Let us consider how the formal approach analyzes the system of English tenses. In formal semantics, the following parameters are typically used to describe temporal meanings: the event time (e), the reference time or speech time (s), and the topic time (t). These parameters make it possible to formally describe the differences between different temporal forms. For example, Simple Past (past simple tense) in English is described as: $e \subseteq t \subset s$ (the event time is completely contained in the reference time, which is completely prior to the speech time). Present Perfect (present perfect tense) is described as: $e \subset t$, $t \subseteq s$ (the event time is contained in the reference time, which includes the speech time). Such formal descriptions make it possible to precisely and unambiguously define the differences between temporal forms and to create algorithms for computer processing of texts.

The formal approach also makes it possible to model complex temporal relations in multi-clause texts. For example, in analyzing the sequence of events in a narrative: "John opened the door. He looked around. He saw a letter on the table. He opened the envelope," the formal approach makes it possible to explain how from context and grammatical structure we derive that all these events occurred in chronological order and that each event occurred after the previous one. This is achieved through principles of lexical aspect (event type) and interaction with syntactic structure. The verbs open, look, see in English are achievement verbs with a punctual temporal structure, which facilitates their interpretation as sequential events.

In Russian, the formal description of the temporal system must include not only the three temporal points (as in English) but also the obligatory category of aspect. The perfective aspect often is associated with a punctual or completed event (*on napisal pis'mo* — he wrote a letter), while the imperfective aspect often is associated with a durative or iterative action (*on pisal pis'ma* — he was writing letters / he would write letters). Formal semantics can describe these differences using formulas that precisely define the logical structure of temporal meanings.

The typological approach to studying temporality reveals patterns and regularities in how different languages organize the expression of time. One of the fundamental typological findings is that nearly all languages distinguish between past and non-past time, but the distinction between present and future time is encountered less regularly (Comrie, 1985; Dahl, 1985). This suggests that the category of past tense is more basic in languages of the world than the category of future. In the three languages we study (Russian, English, and Uzbek), there is a clear distinction among all three tenses (past, present, future), which unites them. However, there are significant typological differences in how these tenses are expressed: Russian uses morphological forms (synthetic inflection); English uses analytic constructions with auxiliary verbs; Uzbek uses suffixal affixes in an agglutinative scheme.

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Typological analysis also reveals interrelations between different grammatical categories. For example, Comrie (1985) notes that languages often do not strictly distinguish between tense and aspect at the morphological level. In many languages, one and the same morphological form encodes both temporal and aspectual meaning. In Russian, this is manifest in the close connection between aspect of the verb and its temporal forms: the imperfective aspect can have past, present, and future tense forms (*chitál* — was reading, *chitáyu* — read, *búdu chitat'* — will read), while the perfective aspect can also have all three tenses, but with different semantic nuances (*prochitál* — read, *napishú* — will write, *búdu pisat'* — although for the perfective aspect present tense expresses future meaning). The typological approach makes it possible to understand this complexity as a reflection of the universal tendency in languages of the world toward economy of grammatical forms by serving multiple functions with one form.

Typological research also reveals interesting "deviations" from general patterns. For example, there are languages in which grammatical tense is not obligatory at all, while temporal meaning is expressed by lexical or contextual means. Such languages often use a developed system of aspectual distinctions instead of or in addition to temporal distinctions. This shows that there is no single way to organize temporality in languages; instead, there is a multitude of typological variants, each of which is an adequate solution to the communicative task of expressing temporal relations.

The discourse approach to studying temporality emphasizes the importance of analyzing actual language use. In narrative discourse, the phenomenon that Labov and Waletzky (1997) call "narrative past" is observed: the simple past tense (in English) or past imperfective (in Russian) is used to describe a sequence of events. For example, in an English narrative: "He walked into the room. He looked around. He saw a letter on the table. He opened the envelope." Each sentence in simple past describes an event, and from the order of sentences we derive the chronological order of events. Discourse analysis shows that this is not simply a linguistic convention but a powerful tool for organizing narrative that allows the reader to follow the course of events and construct a coherent representation of the sequence of actions.

In Russian, the discourse use of tenses in narrative is interesting in that past perfective tense (on otkryl dver', posmotrel po storonam, videl pis'mo, otkryl konvert — he opened the door, looked around, saw the letter, opened the envelope) is used mainly to express the sequence of punctual events, and may use past imperfective (*on otkryval dver', smotrel po storonam* — he was opening the door, was looking around) to express background or durative actions in relation to the main narrative flow. This interaction between aspect and tense in Russian discourse is one of the most complex aspects of Russian grammar for learners of it as a foreign language.

Uzbek also demonstrates specific discourse patterns. For example, when describing a sequence of events in Uzbek, constructions that explicitly mark temporal sequence through syntactic structure and function words are often used: "*Birinchidan, u eshikni ochdi. Keyin, atrofni tekshirdi. Shundan so'ng, stol ustida xatni ko'rdi.*" (First, he opened the door. Then, he looked around. After that, he saw a letter on the table.) The use of adverbs (*birinchidan* — first, *keyin* — then, *shundan so'ng* — after that) explicitly marks temporal sequence, which is typical for Uzbek discourse.

The discourse approach also reveals the phenomenon of "tense shift," when the speaker transitions from one temporal form to another. For example, in describing a past event, the speaker can unexpectedly switch to present tense (historical present) to create a vivid, dynamic description: "*On otkryvayet dver', smotrit po storonam... i vdrug vidit pis'mo na stole!*" (He opens the door, looks around... and suddenly sees a letter on the table!) This phenomenon is called "historical present" and serves the pragmatic purpose of bringing events closer to the reader, creating an impression of their immediate experience.

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The pragmatic approach to studying temporality focuses on how participants in communication interpret temporal forms in context. One of the key principles of pragmatics is the idea that the meaning of an utterance often extends beyond its literal (semantic) meaning. For example, in English, the sentence "The train leaves at five o'clock" (in simple present tense) can literally be interpreted as a description of usual routine, but in certain contexts (for example, when discussing tomorrow's train departure schedule) it is interpreted as a reference to a future event. This pragmatic expansion of meaning is not a violation of grammar; rather, it reflects the ability of speakers to use linguistic forms creatively to achieve communicative goals.

In Russian, pragmatic analysis reveals interesting features. For example, the form of the imperative mood of an imperfective verb (*chitay!* — read! with durative meaning) vs. perfective verb (*prochitay!* — read! with resultative meaning) creates pragmatic differences in the interpretation of a command. "*Chitay etu knigu*" (Read this book—imperfective) suggests the addressee begin reading and continue, while "*Prochitay etu knigu*" (Read this book—perfective) suggests a specific task of reaching the end of the book. These pragmatic differences are often not encoded explicitly and require interpretation in context and based on background knowledge.

Pragmatic analysis is also applied to understanding implicatures associated with the use of temporal forms. For example, in English, the use of Present Perfect (I have written the letter) instead of Simple Past (I wrote the letter) often implicates that the action has relevance at the present moment. "I have written the letter" may implicate: (1) the letter is already written and ready to send, or (2) I finished writing the letter recently and it is relevant to the current situation. The choice of tense carries pragmatic information about how the speaker evaluates the relevance of the past event to the current context.

Integration of Approaches: Possibilities of Comprehensive Analysis

Although each of the approaches described has its own strengths and makes its own contribution to understanding temporality, the most fruitful results are achieved when they are combined and integrated. An integrated approach to research in temporality can be developed by synthesizing the strengths of each approach while avoiding their limitations.

The functional approach provides a structural framework for analyzing the interaction of different linguistic means; the cognitive approach explains why certain metaphorical and conceptual structures seem natural; the formal approach provides precision and rigor in definitions; the typological approach provides a cross-cultural perspective and helps identify universals; the discourse approach shows how temporality functions in the context of real communication; the pragmatic approach explains how participants interpret temporal forms depending on context.

For example, in analyzing the phenomenon of the perfect in English, an integrated approach can be applied as follows. Functionally (Bondarko, 1990), the perfect performs a specific function of linking a past event to the present moment. Cognitively (Evans, 2004), this can be explained through the concept of "resultativity"—the idea that an action, although it occurred in the past, has left a trace or consequence in the present. Formally (Kamp & Reyle, 1993), the perfect can be described through a three-part system of temporal points, where the event precedes the speech time but has a relation to the speech time through the introduction of an intermediate point of reference. Typologically (Comrie, 1985), the perfect is one of the most widespread grammatical categories in world languages, but the ways of its expression vary significantly. Discursively (Labov & Waletzky, 1997), the perfect is often used to introduce "background information" in narrative—information that contextualizes main events. Pragmatically (Levinson, 1983), the choice of perfect instead of simple past signals to the reader that the speaker considers this event as having relevance to the current situation.

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Such an integrated analysis provides much more complete and deep understanding of the phenomenon than analysis limited to one approach. It makes it possible to explain not only what is happening (morphological description) but also why it is happening (cognitive bases), how it can precisely be described (formal semantics), how it is structured in different languages (typology), how it is used in real communication (discourse and pragmatics).

Conclusion

The review of the main scientific approaches to the study of temporality demonstrates the richness and multifaceted nature of methodological resources available to modern linguistics. The functional approach provides a foundation for understanding the interaction of different linguistic means; the cognitive approach reveals the cognitive bases of expressing time; the formal approach provides precision and rigor; the typological approach reveals universal patterns and language variations; the discourse approach shows the functioning of temporality in the context of real communication; the pragmatic approach explains the interpretation of temporal forms depending on context.

Each approach, taken in isolation, has certain limitations. The functional approach can be simplifying in describing the peculiarities of a concrete language system. The cognitive approach is sometimes speculative and requires empirical verification. The formal approach can be detached from actual language use. The typological approach may be limited by the representativeness of the studied linguistic material. The discourse approach can be difficult to systematize and may not provide generalizable principles. The pragmatic approach often requires a large amount of contextual information for interpretation. However, these limitations can be overcome by combining approaches in such a way that the strengths of one approach compensate for the weaknesses of another.

The integration of different approaches is a promising direction in the development of linguistic theory of temporality. Such integration does not mean simple addition of different approaches but rather their synthesis into a unified coherent system in which each approach makes a contribution complementary to the contributions of other approaches. Modern linguistics is moving toward exactly such an integrated methodology, in which it is recognized that temporality is a multi-level and multi-faceted phenomenon that cannot be fully understood from a single perspective.

Analysis of the application of different approaches to Russian, English, and Uzbek shows that although all three languages use different formal means to express time (morphological in Russian, analytic in English, agglutinative in Uzbek), the basic functional, cognitive, and pragmatic principles organizing temporality seem to be universal. This suggests that temporality is not simply a linguistic phenomenon but a reflection of deep regularities in human cognitive and social interaction with time.

Future research should strive toward even closer integration of different approaches and the development of a unified theoretical framework that can explain both universal aspects of expressing time in languages and language-specific variations. An important direction is also the development of computational models that can implement the findings of different approaches and provide practical application of the theory in the field of natural language processing and machine translation.

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