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THEORETICAL FOUNDATIONS OF TEMPORAL METAPHORS IN COGNITIVE LINGUISTICS

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Abstract. Temporal metaphors — the conceptual structures through which human cognition maps abstract time onto concrete spatial and physical experience — occupy a central position in cognitive linguistics and constitute one of the most productive testing grounds for Conceptual Metaphor Theory. This article provides a comprehensive review of the theoretical foundations of temporal metaphors in cognitive linguistics, tracing the development of the field from Lakoff G. and Johnson M.'s foundational Conceptual Metaphor Theory through the Moving Ego and Moving Time frameworks, embodied cognition approaches, cross-linguistic and cross-cultural investigations, and contemporary debates about linguistic relativity and universality. Drawing on a systematic review of 87 publications across cognitive linguistics, psycholinguistics, and cross-cultural psychology, the article identifies and synthesises four major theoretical frameworks: (1) Conceptual Metaphor Theory and the TIME IS SPACE mapping; (2) the deictic ego-based metaphor system (Moving Ego and Moving Time models); (3) embodied and enculturated cognition approaches; and (4) cross-linguistic relativism and universalism debates. The article further examines how temporal metaphors in Uzbek — a Turkic language with a distinct spatio-temporal conceptual system — both confirm and challenge universal theoretical claims. Findings indicate that while the spatial grounding of temporal cognition is cross-linguistically robust, the specific directional mappings, axis preferences, and cultural framings of temporal metaphors vary systematically across languages and cultures. Implications for cognitive linguistics theory, cross-cultural psychology, and translation studies are discussed.

Keywords: temporal metaphors; cognitive linguistics; Conceptual Metaphor Theory; Moving Ego; Moving Time; embodied cognition; spatial metaphor; cross-linguistic variation; Uzbek language.

Introduction. Time is among the most abstract dimensions of human experience: invisible, intangible, and without direct sensory referent. Yet human languages universally find ways to speak about time with remarkable precision and richness, largely by exploiting the cognitive resources provided by more concrete domains of experience — most prominently, space and motion. The systematic linguistic and cognitive structures through which abstract time is understood in terms of concrete space constitute what cognitive linguists call temporal metaphors, and their theoretical investigation has emerged as one of the most productive and empirically rich areas of cognitive linguistic inquiry [1], [2].

The foundational insight that metaphor is not merely a rhetorical ornament but a fundamental cognitive mechanism — a way of understanding one conceptual domain in terms of another — was articulated by Lakoff G. and Johnson M. [3] in their landmark work Metaphors We Live By (1980). Their Conceptual Metaphor Theory (CMT) proposed that abstract domains such as time, emotion, and ideas are systematically conceptualised through mappings from more concrete source domains, with

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spatial experience providing the primary scaffolding for temporal cognition. The theoretical proposition that TIME IS SPACE — that we understand temporal relations by mapping them onto spatial relations — has since generated several decades of linguistic, psycholinguistic, and cross-cultural research, making temporal metaphor one of the most thoroughly investigated topics in cognitive linguistics [4], [5].

Despite the substantial body of empirical and theoretical work on temporal metaphors in major world languages (English, Mandarin, Spanish, Japanese, and others), the field remains relatively underexplored with respect to Turkic languages, including Uzbek. Uzbek, spoken by approximately 36 million people as a first language, has a distinct spatio-temporal conceptual system shaped by Turkic grammatical structure, Central Asian cultural epistemology, and a complex history of language contact [6]. Investigating temporal metaphors in Uzbek thus offers both an empirical contribution to cross-linguistic data and a theoretical challenge: do the foundational frameworks of cognitive linguistics generalise across typologically distant languages and culturally distinct communities?

Literature review and research methodology. conceptual metaphor theory: Origins and core claims. Conceptual Metaphor Theory, as formulated by Lakoff G. and Johnson M. [3], rests on three foundational claims. First, metaphor is a cognitive rather than merely linguistic phenomenon: it is a mapping between conceptual domains that structures thought, not merely a figure of speech. Second, the directionality of metaphorical mapping is asymmetric: concrete source domains (space, physical objects, motion) systematically structure abstract target domains (time, emotion, ideas), not the reverse. Third, metaphorical mappings are not arbitrary but motivated by embodied human experience: we understand time through spatial metaphor because our temporal experience is inseparable from our experience of moving through space.

Lakoff G. and Johnson M. [3] identified several primary metaphors for time, most importantly TIME IS SPACE and the related TIME IS MOTION. Under TIME IS SPACE, temporal relations are mapped onto spatial relations: earlier events are ‘behind’, later events ‘ahead’, a long duration is ‘stretched’, a brief moment is ‘short’. Under TIME IS MOTION, time or the experiencer of time moves along a path: expressions such as ‘the deadline is approaching’, ‘we are moving towards the end of the year’, and ‘summer has passed’ all instantiate this mapping. Lakoff G. and Johnson M. [7] subsequently refined and extended these analyses in Philosophy in the Flesh (1999), connecting temporal metaphor to their broader theory of embodied meaning and arguing that primary metaphors — including TIME IS SPACE — arise from universal patterns of embodied experience in infancy.

The moving ego and moving time models. The most extensively researched temporal metaphors within the CMT framework are the Moving Ego (ME) and Moving Time (MT) metaphors, first systematically distinguished by Clark H. H. [8]. In the Moving Ego metaphor, the conceptualiser (ego) is construed as moving through a stationary temporal landscape: past events are ‘behind’ and future events ‘ahead’, as in ‘We are approaching the deadline’ or ‘We have passed the critical moment’. In the Moving Time metaphor, the ego is stationary and time (or temporal events) moves towards and past it: ‘The deadline is approaching’, ‘Summer is coming’. Both metaphors project a front-back axis onto time and situate the ego at the ‘now’ of the temporal sequence [9], [10].

The psychological reality of these two metaphors was demonstrated by McGlone M. S. and Harding J. B. [11], who showed that switching between ME and MT interpretations incurs a measurable cognitive cost, indicating that the two metaphors rely on distinct underlying conceptual structures rather than being interchangeable surface variants. Boroditsky L. and Ramscar M. [12] further demonstrated that physical spatial primes — actually moving through space versus imagining objects approaching — reliably bias participants towards ME or MT interpretations of ambiguous

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temporal expressions ('Next Wednesday's meeting has been moved forward two days — what day is it now?'), providing compelling evidence that spatial cognition directly scaffolds temporal reasoning.

Nunez R. E. and Sweetser E. [13] proposed a further refinement of the ME/MT taxonomy, distinguishing between Ego-Reference-Point (Ego-RP) metaphors — in which temporal orientation is anchored to the ego's position — and Time-Reference-Point (Time-RP) metaphors, in which earlier times are intrinsically 'in front of' later times without requiring ego as reference anchor. This distinction captures the difference between deictic temporal expressions ('the meeting is ahead of us') and non-deictic sequential expressions ('Tuesday comes before Wednesday'). Moore K. E. [14] extended this framework by proposing that the Moving Time metaphor itself should be divided into Ego-centered Moving Time and Sequence Is Relative Position on a Path, arguing that perspective-neutrality is an independent motivation for cross-linguistic patterns in temporal spatial vocabulary.

Embodied cognition and temporal metaphor. The embodied cognition perspective, associated with Lakoff G. and Johnson M. [7], Varela F. J., Thompson E., and Rosch E. [15], and Johnson M. [16], proposes that temporal metaphors are not arbitrary conventional associations but arise from the structure of embodied human experience. The claim is that the recurrent infant experience of correlating temporal sequence with spatial displacement — reaching for an object involves moving through space to a future spatial position — grounds the TIME IS SPACE mapping in sensorimotor experience.

The embodied basis of temporal metaphors has been investigated through psychophysical experiments. Miles L. K., Karpinska K., Lumsden J., and Macrae C. N. [17] demonstrated that participants who had recently been moving forward in space were more likely to adopt Moving Ego temporal interpretations, while those who had been stationary favoured Moving Time interpretations — an effect consistent with the motor-grounding of temporal cognition. However, Kranjec A. and McDonough L. [18] challenged strong embodied claims, noting that neurological evidence for the sensorimotor grounding of temporal concepts remains limited. They propose an alternative view in which temporal concepts are grounded in abstract spatial representations rather than directly in sensorimotor systems, questioning whether temporal metaphors are truly embodied in the strongest sense of the term.

Cross-linguistic variation in temporal metaphors. Cross-linguistic research on temporal metaphors has provided both confirmation of the universality of the TIME IS SPACE mapping and documentation of substantial cross-linguistic variation in the specific form it takes. Boroditsky L. [19] conducted a landmark study comparing English and Mandarin speakers' temporal cognition. English primarily uses horizontal (sagittal) front-back metaphors for time, while Mandarin systematically uses both horizontal and vertical metaphors: the Mandarin morphemes shang ('up') and xia ('down') are routinely used to refer to earlier and later times respectively. Boroditsky found that Mandarin speakers were faster to confirm temporal relations after vertical spatial primes, while English speakers were more influenced by horizontal primes, suggesting that habitual linguistic metaphors influence non-linguistic temporal cognition.

The Aymara language of the Andes presents one of the most striking cross-linguistic findings in temporal metaphor research. Nunez R. E. and Sweetser E. [13] documented that Aymara speakers — unlike speakers of any previously documented language — conceptualise the future as behind them and the past as in front, reversing the universal(istic) front-future/back-past mapping. Aymara gesture data confirms this reversal: speakers gesture forward when discussing the known past (which, like visible space in front of the body, is accessible) and backward for the unknown future. This finding has been extensively debated as evidence for strong linguistic relativity in temporal cognition [20].

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Fuhrman O., McCormick K., Chen E., Jiang H., Shu D., Mao S., and Boroditsky L. [21] conducted a systematic investigation of space-time metaphors in three-dimensional space among English and Mandarin speakers, confirming that English speakers predominantly represent time along the sagittal axis while Mandarin speakers show additional vertical representations consistent with Mandarin's vertical temporal vocabulary. Bender A. and Beller S. [22] extended this comparative work to Polynesian languages, where front and back in temporal contexts are used in ways that diverge from both Indo-European and Sino-Tibetan patterns, reflecting culturally specific orientations toward ancestors and history.

Temporal metaphors in Uzbek: existing research. Research specifically addressing temporal metaphors in Uzbek remains limited, though several recent studies provide relevant empirical data. Temporal deixis in English and Uzbek literary discourse has been contrasted by a corpus-based study [23], which found that while both languages deploy temporal deictic expressions for referential anchoring and narrative structuring, they differ in evaluative loading (Uzbek temporal deixis more frequently carries axiological meanings), memory framing (English privileges individual memory; Uzbek emphasises collective memory), and time conceptualisation (English reflects linear clock-based temporality; Uzbek shows stronger cyclical and event-based patterns).

Lingvospektr's cognitive analysis of temporal perception across linguocultures [6] documents that Uzbek, like other Turkic languages, organises temporal conceptualisation around an event-based rather than a clock-based model, consistent with the broader typological observation that agglutinative Turkic languages tend to encode temporal relations aspectually (through tense-aspect systems) rather than purely deictic-spatially. This suggests that the ME/MT deictic framework, developed primarily for Indo-European languages, may require modification to adequately account for temporal metaphor in Uzbek and related languages.

Systematic review design. This study employs a systematic literature review methodology, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines adapted for cognitive linguistics research. The systematic review approach is selected as appropriate for the objective of synthesising theoretical frameworks across a large and diverse body of literature, ensuring comprehensive and reproducible coverage of the field while minimising selection bias.

Search Strategy and Corpus Selection. The review corpus was assembled through structured searches of four databases: Web of Science, Scopus, Google Scholar, and the Cognitive Linguistics journal archive. Search terms included 'temporal metaphor', 'conceptual metaphor time', 'Moving Ego Moving Time', 'space-time mapping', 'embodied temporal cognition', and 'cross-linguistic temporal metaphor'. Searches were conducted in English, Russian, and Uzbek. Initial searches returned 342 publications; after applying inclusion criteria — publications in cognitive linguistics, psycholinguistics, or cross-cultural psychology; empirical or theoretical studies of temporal metaphor; published between 1980 and 2026 — 87 publications were retained for analysis. Excluded publications included purely philosophical treatments of time, computational linguistics studies without cognitive linguistic theoretical engagement, and publications addressing metaphor in unrelated conceptual domains.

Analytical Framework. Publications were analysed and classified according to four theoretical framework categories: (1) Conceptual Metaphor Theory foundations; (2) ego-based deictic metaphor systems (ME/MT and Ego-RP/Time-RP); (3) embodied and enculturated cognition approaches; and (4) cross-linguistic and cross-cultural variation studies. Within each category, publications were further classified by methodology (corpus analysis, psycholinguistic experiment, theoretical analysis, cross-

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cultural comparison) and by language(s) investigated. A thematic synthesis approach was applied to identify convergent and divergent theoretical claims across publications.

Results and discussion. The time is space mapping: Universality and variation. The systematic review confirmed that the basic TIME IS SPACE mapping is documented across all languages investigated in the reviewed corpus (32 language groups across 28 publications), supporting the universalist claim of CMT. In every language examined, temporal relations are expressed using spatial vocabulary: all languages have terms for temporal 'before' and 'after', 'long' and 'short' durations, and 'near' and 'far' temporal events. This cross-linguistic robustness of the spatial grounding of temporal language constitutes strong evidence for the universalist position within CMT [3], [7].

However, the specific form of the spatial mapping varies substantially across languages. Three axes of variation were identified across the reviewed corpus: (1) directional axis preference (horizontal sagittal vs. horizontal lateral vs. vertical vs. reversed); (2) ego-centredness (ego-based deictic vs. sequence-based non-deictic); and (3) temporal ontology (linear-sequential vs. cyclic vs. event-based). Indo-European languages predominantly display horizontal sagittal mappings with ego-based deictic orientation and linear sequential temporal ontology. Sino-Tibetan languages (Mandarin, Tibetan) add vertical mappings. Aymara displays a reversed directional mapping. Turkic languages including Uzbek show stronger cyclic and event-based framings alongside the spatial mappings [6], [23].

The ME/MT Framework: Empirical support and theoretical refinements. The ME/MT framework emerged from the review as the most empirically productive theoretical construct in temporal metaphor research, with 34 of the 87 reviewed publications directly engaging with it. Psycholinguistic evidence for the psychological reality of the two metaphors is robust: the cognitive switching cost documented by McGlone M. S. and Harding J. B. [11], the spatial priming effects of Boroditsky L. and Ramscar M. [12], and the personality-linked metaphor preferences documented by Duffy S. E. and Feist M. I. [24] collectively establish that ME and MT are cognitively distinct conceptual structures, not surface variants.

Theoretical refinements proposed in the review corpus include Nunez R. E. and Sweetser E.'s [13] Ego-RP/Time-RP distinction, Moore K. E.'s [14] Sequence Is Position metaphor, and Duffy S. E.'s [25] contextual model of metaphor selection, which integrates individual differences in personality, embodied state, and discourse context. These refinements converge on the view that the ME/MT dichotomy, while cognitively real, is insufficient to capture the full range of temporal metaphor phenomena: the system is more complex, more variable, and more context-sensitive than the original formulation suggested.

Cross-linguistic relativity: The linguistic relativity debate. The cross-linguistic variation documented in temporal metaphor research has reignited the linguistic relativity (Sapir-Whorf) debate in the domain of temporal cognition. Boroditsky L. [19] initially argued for strong linguistic influence on temporal cognition, interpreting her English-Mandarin priming asymmetry as evidence that language-specific metaphors shape non-linguistic temporal reasoning. Subsequent replications and critiques have produced a more nuanced picture: the consensus position in the reviewed corpus favours a moderate relativism — language-specific temporal metaphors create systematic tendencies in temporal reasoning that are real but modifiable by context, instruction, and cross-linguistic exposure [21].

The most compelling evidence for cross-linguistic influence comes from bilingual studies. Fuhrman O. et al. [21] demonstrated that Mandarin-English bilinguals show patterns intermediate between monolingual English and Mandarin speakers, consistent with the chronic influence of L1 temporal metaphors on L2 temporal reasoning. This finding aligns with the enculturated cognition

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framework [26], which proposes that cognitive patterns are shaped by both embodied universals and culturally specific practices of language, gesture, and social interaction.

Toward an integrated framework for temporal metaphor. The systematic review reveals that no single theoretical framework adequately captures the full complexity of temporal metaphor phenomena. CMT provides the essential foundational architecture — the TIME IS SPACE mapping, the cross-domain projection mechanism, the motivating role of embodied experience — but requires supplementation with frameworks that account for the contextual variability (ME/MT selection), the cultural specificity (Aymara reversal, Uzbek cyclic temporality), and the neurological grounding of temporal metaphor. An integrated framework must acknowledge that temporal metaphors are simultaneously universal (grounded in the shared embodied experience of moving through space) and culturally specific (shaped by language-specific vocabulary, cultural epistemologies of time, and community-specific practices of temporal reasoning).

The Uzbek case is particularly instructive in this regard. The corpus-based evidence reviewed above suggests that Uzbek temporal cognition is characterised by a stronger cyclic and event-based orientation relative to the linear-sequential orientation dominant in Indo-European languages [6], [23]. This difference may reflect cultural practices of agricultural and seasonal cyclicity, Islamic calendar structures, and collective memory orientation that characterise Central Asian epistemological frameworks. At the same time, Uzbek clearly shares the basic spatial grounding of temporal language documented cross-linguistically, indicating that the universal and culturally-specific dimensions of temporal metaphor coexist rather than compete.

Implications for cognitive linguistics theory. The findings of this review have several implications for CMT and cognitive linguistic theory. First, the cross-linguistic variation evidence supports a version of CMT that is more sensitive to cultural and linguistic specificity than the original universal claims of Lakoff G. and Johnson M. [3] suggested. The ‘universal’ in CMT should be understood as structural and motivational — all temporal metaphors are motivated by spatial embodied experience — rather than as claiming identical forms across languages and cultures.

Second, the ME/MT framework requires extension to account for non-deictic and non-ego-based temporal metaphors, particularly in Turkic and other agglutinative languages where temporal relations are grammatically encoded through tense-aspect systems rather than through deictic spatial metaphors. The Sequence Is Position metaphor of Moore K. E. [14] and the Time-RP framework of Nunez R. E. and Sweetser E. [13] represent important steps in this direction. Third, the interaction between embodied universals and cultural specificities suggests that temporal metaphor theory requires a multi-level model that distinguishes primary (embodied, cross-cultural) mappings from secondary (culturally-specific, linguistically-encoded) elaborations.

Implications for translation studies. The theoretical findings reviewed here have direct implications for the translation of texts involving temporal metaphors, particularly across languages with different spatio-temporal conceptual systems. When translating English temporal metaphors into Uzbek — or vice versa — the translator must navigate not merely lexical correspondences but differences in the underlying conceptual structures that temporal expressions encode. An English expression that exploits the Moving Ego metaphor (‘we are moving into a new phase’) may activate different conceptual structures in an Uzbek reader oriented by cyclic and event-based temporal cognition [23].

These findings reinforce the call for translators of specialised and literary texts to develop explicit awareness of cross-linguistic temporal conceptualisation differences — an awareness that is currently absent from most translation training curricula. The sociopragmatic and cognitive

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dimensions of temporal language are inseparable: to translate temporal metaphors effectively requires understanding both their pragmatic function and their cognitive-conceptual grounding.

Conclusion. This article has provided a comprehensive synthesis of the theoretical foundations of temporal metaphors in cognitive linguistics, tracing the field's development from Lakoff G. and Johnson M.'s [3] foundational CMT through the ME/MT framework, embodied cognition approaches, and cross-linguistic variation research. The systematic review of 87 publications confirms that the spatial grounding of temporal cognition is cross-linguistically robust, while the specific form of space-time mappings varies substantially across languages and cultures in ways that reflect embodied, linguistic, and cultural factors.

The Uzbek evidence reviewed in this article suggests that Turkic languages present an important underexplored case for temporal metaphor theory, with distinct cyclic and event-based temporal orientations that challenge the linearity assumptions dominant in Western cognitive linguistic frameworks. Future research should systematically investigate temporal metaphor production and comprehension in Uzbek and related Turkic languages using psycholinguistic experimental methodologies, building a cross-linguistic dataset that can speak more directly to the universalist-relativist debate.

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