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Conceptual Modeling of Discrete-Continuum Time-Perception

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This article is dedicated to discrete-continuum time-perception model and its realization in the Modern English. Identification of dynamic time perception and relatively static / discrete temporality perception is explained. Dynamic time-perception includes linear and circular time models which can be represented in a text as temperostatic and temperodynamic models. Relatively static / discrete time-perception includes chronography, chronometry, "eventivity", instantivity and frequentativity. The mechanism of conceptual models transformation into certain cognitive models through the cognitive operation of focusing is also shown.

Keywords: relatively static / discrete time-perception, chronography, eventivity, chronometry, frequentativity, instantivity, dynamic time-perception, linear and circular time models, temperostatic and temperodynamic models.

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As Nikolai N. Boldyrev points out, many researches are grounded in the idea that our knowledge is constructed by the means of certain structures – cognitive models. Among other things, this idea is actualized under such theories as Ch. Fillmore's frame semantics, G. Lakoff and M. Johnson's theory of metaphor and metonymy, R. Langacker's cognitive grammar, G. Fauconnier's mental spaces, E. Rosch's prototype theory and etc. Relying on such cognitive models we are able to explain general cognitive processes as well as their mechanics, namely, that categorization of the world and language takes place through cognitive models or schemes (Boldyrev, 2000a: 17; Boldyrev, 2000b: 36).

Alongside with conceptual, frame and prototypical analysis, cognitive modeling comes under the methods actively used by cognitive linguists to describe conceptual content underlying language units' meaning (Besedina, 2011). Yet W. Chafe considers cognitive modeling as one of the most efficient and prospective linguistic methods. According to his perspective, a cognitive model means a certain stereotype which organizes our experience (Chafe, 1983).

In building a conceptual model of subjective discrete-continuum perception of time G. Guillaume's idea of "spacialization" – a necessity to transform mental entities (including such non-spacial dynamic entities as time) into

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spacial representations (schemes) – is crucial as well (Guillaume, 1992). As V.Ia. Shabes (Shabes, 1992: 26) assumes, Guillaume's spacial representation is rationally realized in the model of binary tensor, which is indeed a way of discrete-continuum vector representation of mental units' development. In Guillaume's perspective, the most important thing among basic and potential cognitive processes is the one related to a two-way dynamic of a thought towards singular and general. This dynamic can also be seen in the process of time spacialization within the whole verb classification which constantly encounters a shift from general to specific time – present time – and vice versa. In other words, there is a shift from time discreteness and extremity to its non-discreteness and eternality (cit. ex: Shabes, 1992: 26).

In passing from time extremity to time eternality and back our consciousness makes certain steps. Taking into consideration transformational integration of similarities – a method based on the idea that any mental representation can be transformed into any other through a particular number of discrete transformational actions (Hahn et al., 2003) – it is safe to assume that any time span can be separated by our consciousness into smaller discrete cuts. Thus, for example, a year with all the events within can be reduced to months; months – to weeks and weeks – to days, etc. down to the briefest time units, which, on the one hand, can be represented as the continuum's elements or, on the other, – as separate discrete units with specific features and certain events or actions inside. "Given that, time can be shown as a mosaic made of non-similar "frames" which not necessarily can form a continuum" (Kasevich, 2013: 43). As H. Bergson considers, "each of the external world's states, called consistent, exists separately and their unity is real only for our consciousness capable of maintaining them

first, and then, of laying them out in space, one to another… it percepts them as a certain multiplicity. This, in turn, causes their expansion in series where each of them exists separately" (Bergson, 1992: 88-89).

The same idea is addressed by Y. Konate: continuum is time's nature, so one cannot turn it back. In this regard, the author introduces the notion of temporal horizon – time projections beyond the present. This means a project, plan, i.e. an image-building of the future starting from the tasks identification to be carried out. Such sequence means continuality alongside with discreteness (Konate, 1996: 149).

Regarding "Time" as one of event categories (together with "Place", "Agent", etc.) (Shabes, 1989), V.Ia. Shabes also states that its actualization can be demonstrated in two ways: as a whole continual process or as a discrete sequence of actions. The last case characterizes it by order, circularity and intervality (Shabes, 1990: 17).

Time can be estimated by a gradual pattern. V.Ia. Shabes classifies linear time as an open mono-parametric gradual pattern, since it represents a single feature of thing or phenomenon (its continuance or durability) and has no bounds either in the past or in the future. At the same time, as any other open pattern, time's discretion can be linguistically limited – by such nominations as "since time immemorial" and "in some distant future" (Shabes, 2008: 39).

Having generalized the results of linguistic researches by the scientists mentioned above and, further, relying on the analysis of facts we are eager to propose a model of discrete-continuum perception of time (Fig. 1). As this study suggests, the conceptual model means an abstraction reconstructed under the analysis of remarkable linguistic material and characterized by hierarchy; at most generalized form it reflects mental representation of one's temporal experience and encapsulates the whole range of

links between the elements of this experience in the person's consciousness. Conceptual models of time-perception are converted to cognitive models as the result of cognitive procedures of perspectivization. The last takes shape as a set of profiling / de-profiling actions (focusing / de-focusing) mainly on such key elements in the perception field as person and time.

This discrete-continuum time perception expressed through the English language can principally be subdivided into dynamic perception which detects time's continuity and relatively-static or discrete perception. The first one suggests an experience of its permanent motion from the past to the future, or, vice versa – from the future or eternality to the person (Price, 1996; Savitt, 1997). This movement can be both linear (*time flies like an arrow, time and tide wait for no man*) and circular (*time is like a circle, a circle of life*). Given that, the speaker's position can also be static or dynamic. The first refers to a temperodynamic model of time perception: a person remains static – they do not move across time – and acts as a landmark; time – trajector or moving object – is perceived as something moving towards the person (*take each day as it comes*) or passing them by (*time goes by*). Being a mobile element of the scene, time,

thus, holds greater salience, forms principal focus and becomes a figure, while the person is left as a ground unit on the secondary stage.

Those phrases which verbalize this model of temporality tend to have TIME IS A MOVING OBJECT / SUBJECT metaphor.

In articulation of temperostatic model time is shown as a road or path the person is assumed to take (*time is like a road, race against time*). In this case time is a landmark; time is static and it determines direction of the person-trajector which slowly moves from the present to the future unless the latter becomes the present for them and there is another future to appear – and it will continue until this one reaches their destination – death. This model represents time as a ground which localizes the figure (person) and shifts to the secondary focus. Textually these cases are expressed through the TIME IS ROAD –metaphor.

In such a way, when applying cognitive operations of perspectivization the concept model of dynamic time-perception transforms into temporal-static and temporal-dynamic cognitive models of time-perception.

The relatively-static or discrete time perception is understood as voiced time spans or points on the timebase without any reference to
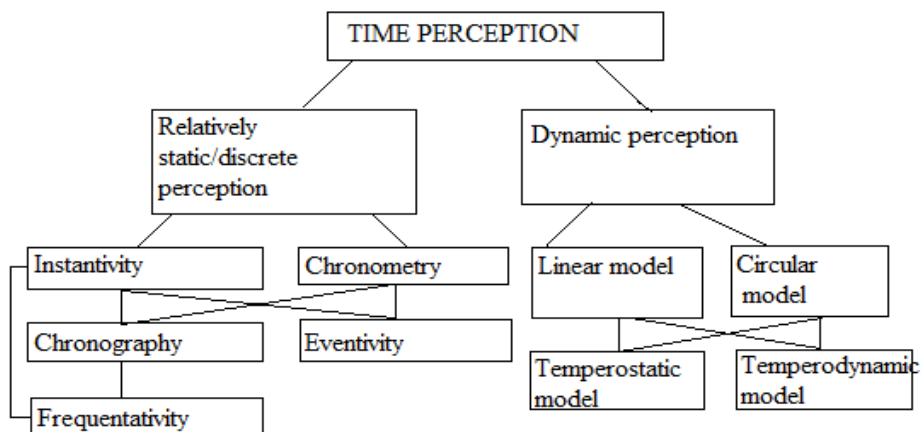

Fig. 1. Conceptual framework of discrete-continuum time perception

the temporal dynamics. Our consciousness seems to "grab" the event from the time continuum and fixes it as a discrete object bound to a particular point on the timebase. As long as we are dealing with a certain time span, we classify such examples in chronometry (*he was reading for 2 hours*). If in contrast the text expresses time-perception, event-perception, etc. as instants, so we may speak about instantity (*she came at 3 o'clock*). In both cases – chronometry and instantity – the text tends to include another model of time perception: either chronography which refers to a specific time-frame, date or eventity. The last one includes text description of particular event instead of its date and time (*they got married after the war*). Similarly, instantity contains frequentativity which demonstrates frequency of the action, phenomenon, event and etc. *I've seen her twice; sometimes we meet*).

By taking a cognitive focusing, the conceptual model of discrete time-perception can transform into such cognitive models as "chronography – instantity / chronometry" and "eventity – instantity / chronometry". In the first case, salience is peculiar to a particular historical date, in the second – to event which detects the position for any given point / span on the timebase.

In the text chronography can be expressed explicitly, as in: *He was born in 1886; We met at 5 p.m.* (chronography combined with instantity); *He was playing football from 1 p.m. till 2 p.m.* (chronography combined with chronometry). Indeed, chronography can also be shown implicitly – *during Queen Victoria' reign* – when the text does not include any date per se, but the recipient knows them a priori through their background knowledge. One more type of chronography – relative chronography – occurs when the point's or span's position on the timebase is marked with respect to the moment of speech: *I saw him yesterday*. The relative chronography

correlates with McTaggart's A-conception (McTaggart, 1975) which differentiates the past, present and future. B-conception which places a distinction between the events within "earlier – later" framework can be represented through the explicit chronography (*He came home after 9 p.m.*) and / or eventity (*She phoned me when I had already washed up*).

Our attention is further drawn to the relation between the terminological framework suggested in this work and certain terms used by other linguists in their studies on the time's structure description.

Interpretation of chronography and chronometry in this conceptual model of time-perception is quite similar to V.G. Gak's knowledge of corresponding terms (Gak, 1997). Chronology (following V.G. Gak's point of view) can be expressed according to the conceptual model through chronography, eventity, chronometry (in the case of relatively static time-perception), linear or circular time-models (in the case of dynamic time-perception) depending on the context. Here are some examples which include, basing on V.K. Gak's idea, chronology and conveys, in our observation, different types of personal time-perception:

1. *She was born in 1975 and went to school in 1982.*

2. *They got married when they graduated the University.*

3. *He had lived in Paris for two years before he moved to London.*

4. *Spring always comes after winter.*

5. *She'd passed her childhood and youth and was approaching the age which she called "maturity".*

The first example chronology lines up with chronography, since the sentence contains particular dates for the events described. The second sentence includes chronology alongside with eventity – it is a case of events succession.

The following example one can find both chronometry (reference to a span of two years) and eventivity (movement to London). In (4) we deal with dynamic time-perception – with the circular temperodynamic model in particular (springs always follows winter). Given that, observing the seasons change, the person stays static, i.e. remains the landmark, while time is dynamic (trajector). In (5) one encounters the chronology expressed through the temperostatic linear model. In this case the person act as the trajector and moves down the road of life, undergoing certain stages of ontogenesis determined by the nature and passing the milestones which explicate the chronology.

Relative and egocentric time described by V.Ia. Myrkin (Myrkin, 1989) can also relate to different cognitive models of time-perception. Here are some examples:

1. *When he moved to London she had already been living there for six months.*

2. *Winter is approaching.*

The first case shows us eventivity (movement to London), chronometry (6 month in London) and, following V.Ia. Myrkin's terms, relative time (She had moved to London earlier than he did) and egocentric time (both events refers to the past against the speech moment. The second sentence actualizes the dynamic time-perception – in particular, the linear temperodynamic model (the observer is a static landmark and the time span – winter – a dynamic trajector). At the same time, it is possible to speak about relative time in this case (winter will come later) and egocentric time (winter will come in the future against the moment of speech and its coming can be seen right now).

Obviously, according to V.Ia. Myrkin's conception both cases can prove the existence of relative egocentric times that renders some difficulties on the linguistic analysis. The model of temporality which we have proposed in this work allows carrying out a detailed analysis and specifying the examples of nominations and time spans exemplified above.

Let's further compare these terms with V. Evans's terminology. Having addressed so called Duration Sense, he claims that it can reflect dynamic or relatively static time perception depending on the context. Thus, such example as *The relationship lasted some time* (Evans, 2004: 6) includes chronometry, while *Time drags when you're bored* (Evans, 2004: 7) explicates linear temperodynamic model of time-perception. The moment (Moment Sense) can also be expressed through the linear temperostatic model (as in *The time for a decision is approaching* (Evans, 2004: 6)) or eventivity give the relatively static time-perception: *Doctors had warned that Daniel, five, of Sinfin, Derby, could die at any time* (Evans, 2006: 123). Instantivity (Instance Sense) aligns with frequentativity, whereas the event (Event Sense) – with eventivity. The matrix (Matrix Sense) is reflected through chronometry (*Don't forget to move the clocks forward with the start of Summer Time* (Evans, 2004: 13)) or chronography (*The time is approaching 11 p.m.* (Evans, 2004: 14)). The last example, in turn, also shows the linear temperodynamic model of time-perception. As we think, V. Evans's terms – agentive sense and commodity sense – summarize English representation of such cognitive metaphors as TIME IS A MASTER and TIME IS A POSSESSION respectively.

Let's also briefly touch upon differences between the terms of this work and conceptual bifurcation. As it has been discussed above, among numerous conceptions grounded in differentiation of objective and subjective time, two key tendencies – A. Gell's A-conception and B-conception – are quite distinguishable. A-conception is dynamic, since it relates to the vision of time flow, and subjective as expects an observer who has their past, present and future.

In contrast, B-conception is static and objective: the correlation "earlier – later" does not rely on the observer's perception and characterizes our existence statically (Gell, 1992).

In the suggested model the dynamic time-perception linked to the sense of time movement and formation can be related to the A-conception. Subjectiveness of that kind of perception, as we assume, proves a possibility to identify such grammar metaphors as FUTURE IS PRESENT, FUTURE IS PAST and PAST IS PRESENT in the English language; in particular, owing to these devices, the action which refers to the future or past can be expressed through the Present Tense verb: *I am leaving tomorrow, William the Conqueror invades Britain in 1066*, etc. (see Maslennikov, 2006: 26-28). Thus, the time plan can shift by the speaker's will from the future to present or past, from the past – to present and etc.

The relatively static or discrete perception stays close to the B-conception. However, contrary to A. Gell, we speak not about static nature and objectivity of time sense, but about relative static and certain subjectivity of its perception, since time is dynamic by its nature, and ones who perceive it is always restricted by their subjective evaluation of time spans. In particular, certain time intervals can be comprehended as longer ones, or, vice versa, shorter – depending on the person's negative or positive experience associated with them. Therefore, in our view, it is impossible to talk about an absolute static and objectivity of time-perception.

It is also worth noting that the features of time-perception are determined not only by the person's experience, but by historic and social conditions. In this way, temporality of a member of archaic society may differ significantly from the time-view in the Renaissance or post-industrial epoch. Nevertheless, we assume that it is likely to apply this model of subjective discrete-continuum time-perception to the analysis of temporality verbalization on the example of text dated on different periods of the English language development.

References

Bergson, A. (1992). Opyt o neposredstvennykh dannykh soznaniia [Essay on Direct Data of Our Consciousness], *In Sobranie sochinenii* v 4-h t. [*Collection of Essays in 4 Volumes*], 1, 50-160.

Besedina, N.A. (2011). Kontseptual'no-reprezentativnyi analiz kak metod izucheniia morfologicheskoi reprezentatsii v iazyke [Conceptual-Representative Analysis as the Research Method for Morphological Representation in Language], *In Sibirskii filologicheskii zhurnal* [*Philological Journal of Siberia*], 1, 178-183.

Boldyrev, N.N. (2000a). Kognitivnyi podkhod k izucheniiu glagola i glagol'nykh kategorii [Congnitive Approach to the Study of Verbs and Verb Categories], *In Traditsionnye problemy iazykoznaniia v svete novykh paradigm znaniia* [*Traditional Problems in Linguistics in the Context of New Scientific Paradigms*], 16-35.

Boldyrev, N.N. (2000b). Freimovaia semantika kak metod kognitivnogo analiza iazykovykh edinits [Frame Semantics as the Method of Cognitive Analysis of Language Units], *In Problemy sovremennoi filologii: Mezhvuz. sbornik nauchnykh trudov* [*Interacademic Collection of Scientific Papers*], 1, 36-45.

Chafe, U.L. (1983). Pamiat' i verbalizatsiia proshlogo opyta [Memory and Verbalization of the Past Experience], *In Novoe v zarubezhnoi lingvistike. Vyp. XII. Prikladnaia lingvistika* [*New in the Foreign Linguistics: Applied Linguistics*], 12, 35-73.

Evans, V. (2004). *The Structure of Time. Language, Meaning and Temporal Cognition*. Amsterdam / Philadelphia.

Evans, V. (2006). *How We Conceptualise Time: Language, Meaning and Temporal Cognition*. Sussex.

Gak, V.G. (1997). Prostranstvo vremeni [The Space of Time], *In Logicheskii analiz iazyka: Iazyk i vremia: Posviashhaetsia svetloy pamiati N. I. Tolstogo [Logical Analysis of Language: Language and Time: Of N.I. Tolstoy Blessed Memory]*, 122-130.

Gell, A. (1992). *The Anthropology of Time: Cultural Constructions of Temporal Maps and Images*. Oxford: Berg.

Guillaume, G. (1992). *Printsipy teoreticheskoi lingvistiki [Principles of Theoretical Linguistics]*. Moscow, Progress, 224 p.

Hahn, U. et al. (2003). Similarity as Transformation, *In Cognition,* 87, 1-23.

Kasevich, V.B. (2013). *Kognitivnaia lingvistika: V poiskakh identichnosti [Cognitive Linguistics: In the Search of Identity]*. Moscow, Iazyki slovianskoi kul'tury, 192 p.

Konate, Y. (1996). Minimal Vibrations of Infinite Time, *In Time and Temporality in Intercultural Perspective,* 149-160.

Maslennikova, A.A. (2006). Osobennosti grammaticheskoj metafory [The Features of Grammar Metaphor], *In Metafory iayka i metafory v iazyke [Metaphors of Language and Metaphors in Language]*, 21-44.

McTaggart, J. (1975). The Unreality of Time, *In The Human Experience of Time: The Development of its Philosophic Meaning,* 278-298.

Myrkin, V.Ia. (1989). *Vid i vremia glagola v russkom i nemetskom iazykakh (sopostavitel'nyi analiz) [Verb Aspect and Tense in Russian and German (comparative analysis)]*, Leningrad, LGPI, 126 p.

Price, H. (1996). *Time's Arrow and Archimedes' Point: New Directions in the Physics of Time*. Oxford: Oxford University Press.

Savitt, Steven F. (ed.) (1997). *Time's Arrows Today: Recent Physical and Philosophical Work on the Direction of Time*. Cambridge: Cambridge University Press.

Shabes, V.Ia. (1992). *Rech' i znanie: Uchebnoe posobie k spetskursu "Osnovy rechevoi deiatel'nosti uchitelia" [Speech and Knowledge: Guidance for the Special Course "Fundamentals of Speech Activity for Teachers"]*. St. Petersburg, Obrazovanie, 83 p.

Shabes, V.Ia. (1989). *Sobytie i tekst [Event and Text]*. Moscow, Vysshaia shkola, 175 p.

Shabes, V.Ia. (1990). *Sootnoshenie kognitivnogo i kommunikativnogo komponentov v rechemyslitel'noi deiatel'nosti. Sobytie i tekst: avtoref. dis. ... doktora filol. Nauk [Relations Between Cognitive an Communicative Components in Verbal and Cogitative Activity: Event and Text: Extended Abstract of Doctoral Academic Thesis (Philology)]*. Leningrad, 32 p.

Shabes, V.Ia. (2008). Tipologiia gradual'nykh reprezentatsii [Typology of Gradual Representations], *In Problemy sotsio- i psikholingvistiki: sb. Statei. Vyp. 11: Iazykovaia variativnost' [Problems of Socio- and Psycholinguistics: Collection of Articles: Linguistic Variations]*, 11, 30-43.

Концептуальное моделирование
континуально-дискретного восприятия времени

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В статье описывается модель континуально-дискретного восприятия времени и рассматривается ее репрезентация в современном английском языке. Обосновывается выделение динамичного и условно статичного (дискретного) восприятия времени. При динамичном восприятии времени возможна реализация линейной и циклической, темперостатичной и темперодинамичной моделей. Условно статичное (дискретное) восприятие времени обусловливает оязыковление хронографии, событийности, хронометрии, инстантанности или фриквентативности. В работе также описывается механизм преобразования концептуальных моделей в определенные когнитивные модели благодаря применению когнитивной операции фокусировки.

Ключевые слова: условно статичное (дискретное) восприятие времени, хронография, событийность, хронометрия, фриквентативность, инстантанность, динамичное восприятие времени, время линейное и циклическое, темперостатичная и темперодинамичная модели.

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