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STUDIES IN LANGUAGE

Edited by
Barbara Lewandowska-Tomaszczyk

32

Barbara Lewandowska-Tomaszczyk
Krzysztof Kosecki
(eds.)

Time and Temporality in Language and Human Experience

PETER LANG
EDITION

Culture and language provide two essential frameworks to deal with the concept of time. They view time as observer-determined and thus shed light on multiple and often conflicting temporalities we live in, think, and talk about. Relying on empirical methods, the book explores linguistic and psychological parameters of time perception and conceptualization. It deals, among others, with temporal aspects of language acquisition, neural mechanisms of memory and attention, as well as event structures. Further chapters focus on the understanding of time in philosophy, literature, the arts, and non-verbal communication.

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Introduction: Time as a Multidimensional Concept

Barbara Lewandowska-Tomaszczyk[1] and Krzysztof Kosecki, University of Łódź, Poland

There are two main visions relating to the concept of time. The first, classical one, describes time as constant, universal and possibly extramental. The more recent one, rooted in Einstein's theories of relativity, proposes a space-time perspective and views time as strongly dependent on the observer. Looking across various scientific disciplines which ask questions about the existence and essence of time, a place and role for language studies can be identified as illuminating the role of objective and subjective time as well as shedding light on multiple temporalities we live in, think and talk about.

The research presented in this volume has been inspired by a number of projects investigating time and temporal experience in human life and language with researchers working either independently or in teams. COST Action TD0904 TIMELY, in which the University of Lodz participates, provides us with a unique opportunity to meet and learn from one another in a truely international surrounding. A parallel project from the National Science Centre in Poland, focusing on the Perception of Time as a Linguistic Category (Project No UMO-2011/01/M/HS2/03042), makes it possible for us to deal with complex issues in the cognitive analysis of time in terms of the structure of events, identification and extraction of temporal expressions from large language corpora and several attempts at a new interpretation of time and temporal categories in linguistic and artistic creations. The projects aim to propose a more adequate, mentally mediated, theory of time and a theory of users' time perception and time conceptualization.

Both empirical findings on linguistic temporal parameters, the neural mechanisms underlying time perception, memory, attention, and eventually conceptualization are the cognitive processes closely linked to the understanding of time. Culture and language provide two essential frameworks to deal with time. Event structures, language specificity and cultural framing of events enable time interpretation in culture and language specific ways. Metaphor and other figurative language pave the way to elucidate the complex nature of temporal experience as documented in everyday language, in the language of literature and in the semiotic codes of arts. An interaction of gesture culture, verbal and sign language and time is another area explored and presented across temporal research domains.

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1 Research carried out within COST Action TD0904 *TIMELY*, supported by National Science Centre (NCN) grant No. UMO-2011/01/M/HS2/03042, *Perception of Time as a Linguistic Category*.

A plethora of the questions being raised in connection with time and temporal experience in life, language and arts and our involvement in the relevant research and interest in time across numerous fields of studies, led to the organization of the Time and Temporal Experience in Language and Human Life TimeLing conference by the University of Lodz on 10-12 October, 2012. The conference grouped an international consortium of scholars from a variety of academic disciplines: philosophy, psychology, language acquisition, medical sciences, sociology, literature and media studies, economics, translation and linguistics. The conference was made possible by the financial support of the COST Action TD0904 and the Polish National Science Center (Narodowe Centrum Nauki) grant No. UMO-2011/01/M/HS2/03042, with continuous support of the University of Lodz authorities represented by Prof. Dr. habil. Piotr Stalmaszczyk, Dean of the Philological Faculty. Benefitting from the involvement of the colleagues and students of the Institute of English Studies, University of Lodz, particularly the continuous organizational support of Dr Janusz Badio, the TimeLing conference attracted a number of distinguished scholars of time and provided an excellent opportunity for the participants to hold fruitful discussions and develop new cooperation links. We wish to express our appreciation to all the conference participants and, particularly, to the plenary speakers: Prof. Vyvyan Evans (Bangor University), Prof. Anna Esposito (University of Naples), Prof. James Pustejovsky (Brandeis University), Prof. Roy F. Ellen (University of Kent), Prof. Rolf Ulrich (University of Tubingen), Prof. Katarzyna Jaszczołt (Cambridge University), Prof. Elżbieta Szeląg and Dr Joanna Skolimowska (Nencki Institute of Neuropsychology, Warsaw).

The present volume is a selection of peer-reviewed papers, some of which were presented at the conference, others are written by invited authors. The book is divided into four parts. Each of them deals with a different aspect of time in language. The Introduction is followed by the chapter *TIMELY: A network on timing and time perception,* authored by Dr Argiro Vatakis, Chair of *TIMELY* COST Action TD0904.

Part 1 contains eight papers on the concept of time in philosophy, language and discourse. Barbara Lewandowska-Tomaszczyk looks at the question of time from a general perspective and provides an overview of methods and materials used to study time in language and culture. Dwight Holbrook discusses two approaches to the concept of *the present*, relying on Martin Heidegger's ideas. James Moir plays down the role of temporal factors in discourse and argues instead that the flow of conversation actually depends on human reactions to language through the words themselves. Jacek Waliński discusses two basic concepts of complementarity of time and space in motion, and atemporality of spatial extension in fictive motion in the two papers which follow. Janusz Badio employs experimental methods to describe perception and verbalisation of events. Jerzy Tomaszczyk proposes his interpretation of older language users' intuitions across time. Martina Ivanová shows how Slovak evidential constructions depend on temporal aspects of the con-

text. In the last paper in Part 1, Joanna Latkowska employs a film retelling task to investigate the bilingual Polish-English approaches to creating narratives.

Part 2 investigates aspects of temporal speech processing in two papers. Dan Zakay, Dida Fleisig, and David Neta present conversational materials and a discussion of temporal data in spoken language, and in Anna Esposito, Antonietta M. Esposito, and Marilena Esposito's contribution visual and auditory timing cues in language tasks are analysed.

Part 3, including five contributions, explores aspects of time in grammar and language acquisition. Andrzej Bogusławski presents an outline of his original theory concerning Polish and Russian verbal aspects as expounded in his book *Aspekt i negacja* 'Aspect and Negation' (2004). John Newman and Kristina Geeraert conduct a semantic analysis of time-related tags in the Canadian component of the International Corpus of English (ICE-CANADA). Joanna Pawliczak presents an analysis of metaphors of time in English corpus data. Krzysztof Kosecki argues that time signs in Polish Sign Language are often based on metaphors and metonymies. Agnès Leroux compares ways to construct meanings of duration in English and in French. Finally, Michał B. Paradowski advances a pedagogical model which helps to learn foreign language tense systems.

Finally **Part 4**, with eight contributions, focuses on meanings of time and temporal experience in literature and the arts. Valery Lichev's paper draws on diverse philosophical sources to account for the subjective relativity of time in literature. Jacek Wiśniewski analyses the pivotal role of the Great War for the perception of time in early 20th-century British culture. Jadwiga Uchman presents aspects of time in drama and theatre production with special regard to Christopher Marlowe's play *Doctor Faustus*. Finally, Sonia Front shows how concepts of 20th century physics are used to render time in Caribbean literature. Selga Goldmane adopts a semiotic perspective in the discussion of how time is represented in literary works and films based on them. Karen Heald and Susan Ligget discuss the perception of time and space by artists and psychiatric patients on the basis of short films, and Magdalena Zegarlińska describes the techniques of handling time in David Lynch's films.

The editors present the volume with the hope that it will stimulate a wider and deeper discussion of the perennial questions of what time is, and how we construct, perceive, and interpret time and temporal dimensions.

Lodz, September 2013
Barbara Lewandowska-Tomaszczyk and Krzysztof Kosecki

From Chair of TIMELY COST Action

TIMELY: A Network on Timing and Time Perception

Argiro Vatakis, Cognitive Systems Research Institute, Greece

Introduction

How do we perceive the timing of everyday events? Is physical time comparable to perceived time? The discussion about timing and time perception has been longstanding and has "infiltrated" many different disciplines. But, as yet, time perception has been quite difficult to define, thus leading many cognitive scientists to focus on research related to the interaction of timing with space and timing with various cognitive processes (e.g., attention, memory etc.). In the text below, I briefly present the main topics of interest for TIMELY, including language- the focus of this edited book.

Main Topics of TIMELY

Conceptual analysis and measurement of time: Time is a concept that has intrigued philosophers, anthropologists, biologists, physicists, and psychologists for quite some time now. Since the early days of Psychology, time perception has been among the central concerns of scientific investigations in the field and it has been researched worldwide in both behavioral and neuroimaging settings. However, what concept of time is being studied in each laboratory, and what do the findings really mean? In the literature, one will find a variety of terms such as time sense, psychological time, temporal reasoning, psychological moment etc. and measures of time perception using discrimination, motor tapping, duration, and order judgment tasks, to name just a few. But what conceptual scheme of time perception do all these terms and tasks refer to?

Developmental aspects of time perception: For years now, researchers have been observing the dynamics of protoconversation in early mother-infant interaction. Human infants, beginning as early as the second month of life, can integrate multisensory events on the basis of time [1].

Experience of time by infants and young children, however, is quite different from that of adults, since various psychological and neurobiological mechanisms, which affect sensitivity to time and shape the timing of motor behavior are not yet fully developed [2]. Experimenting with time developmentally will provide valuable information regarding the time course of time perception, but most importantly will influence our knowledge on the association between temporal abilities and the

developmental pattern of the neural mechanisms underlying time perception early in human development.

Culture and language: These domains are major constituents of the sociocultural context which interacts with our experience of time, but their influence on human time perception is yet under-researched. We generally perceive time as moving forward and we often express this linguistically using spatial metaphors. It has also been demonstrated that people whose native language conceptualizes time with a different directionality (vertical vs. horizontal) interpret statements regarding time differently [3]. Thus, suggesting that our concept of time is modulated by the way a given language associates the concepts of time with nontemporal concepts such as space. What happens in the cases where the concept of time is ambiguously represented in language? For instance, the Hindi language uses only one word "kal" for both "yesterday" and "tomorrow" with the meaning being determined by the context [4]. While the Aymara people appear to have a reverse concept of time by using gestures that place the past ahead and the future behind [5]. The interaction of language, culture, and timing in, thus, a highly interesting topic for current and future investigation.

Uncovering the neural correlates of time perception: In order to better understand the mechanisms underlying time perception, it is essential to investigate the existence of specialized brain systems for representing time and the specific structures involved in these systems. Research to date has provided strong evidence that specific structures in the human brain play a role in the processing of temporal information (e.g., basal ganglia, premotor and motor cortex, superior temporal gyrus, inferior prefrontal cortices). The cerebellum, for example, is argued to be involved in a variety of tasks such as speech perception/production, where the timing of brief intervals is an important component. However, it is not yet clear whether or not the cerebellum is involved only in the short-interval timing, or whether it covers a wide duration range. Recent evidence also showed that the parietal cortex is involved in the processing of temporal intervals. Studies of patients with right parietal stroke have shown decreased temporal order sensitivity for visual stimuli in the contralesional side of space [6]. Such findings, suggest that the right parietal cortex may also play an important role in multisensory integration as a function of time and space.

Understanding time perception is also critical in clinical populations. For example, neglect patients mainly show an impairment related to a spatial component of an event, however, neglect can also be observed in the temporal domain [7]. Patients suffering from schizophrenia, depression, or bipolar disorder experience a disorganized time perception. Finally, in studies with dyslexic patients, a deficit in the processing of rapidly presented stimuli has been demonstrated [8]. It seems therefore that other disorders (e.g., aphasia) may have a temporal component that has not been explored yet. Brain functional neuroimaging and animal research

should contribute in further elucidating the underlying mechanisms of time perception.

Time perception research extensions to practical, everyday applications: Given the ambiguity surrounding the concept of time, along with the difficulty in understanding timing, the development of time-related applications has been lagging. Even in Artificial Intelligence, the concept of time and its application in Robotics has not yet been properly explored. The limited time-related applications that have been developed are very successfully and useful. For instance, Tallal and colleagues have developed a therapeutic technique for dyslexics that involve training in temporal processing related tasks. This therapeutic technique was based on research data showing that expanding the transitional element of synthetic syllables (by increasing the formant transition duration from 40 to 100 ms) significantly improved temporal order performance in dyslexics [8].

Until now, scientists have been trying to approach these fundamental issues from a single-discipline perspective. It is now clear, however, that multiple disciplines must interact in order to resolve these issues. TIMELY is one such union bringing together over 200 senior and junior scientists involved in the study of time from different perspectives. This common multidisciplinary effort is unique with the potential to take time-research a step forward.

Acknowledgments

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PART 1

TIME IN PHILOSOPHY, LANGUAGE AND DISCOURSE

Time and Time Experience in Language

Barbara Lewandowska-Tomaszczyk[1]*, University of Lodz, Poland*

Abstract

The paper focuses on the perception of time and temporal categories as mediated via language and in particular on the interplay between their ontological position juxtaposed with their conceptual function, also with respect to the framework of temporal metaphoric representations and construal in terms of a range of linguistic structure types. It is proposed that temporal expressions are used in language to account for the structure of *events* under the cognitive assumption of *iconicity* between form and meaning. A discussion is presented on *fully elaborated temporal expressions* in event structure as opposed to their *reduced* versions as well as their contribution to *asymmetric events* in language, and exemplified with the materials from large language corpora.

Keywords

Aktionsart, aspect, asymmetric events, construal, English, grammar, iconicity, linguistic elaboration, metaphor, modality, morphology, parts of speech, Polish, Relativity Hypothesis, resemblance, temporality, tense, time

Introduction

The questions which arise with reference to time experience and its manifestation in language involve a number of specific issues. The first relates to the way experience humans acquire and posses is organized in terms of a temporal framework and how this experience is expressed in terms of the grammatical categories available in languages. How do linguistic forms accommodate various types of temporal displacement, in which the actual temporal point of reference is different from that described or referred to in a linguistic utterance? Then the question is what mental models language users develop to grasp and convey the notion of time, particularly in terms of the ongoing debate on the actual (physical and ontological) and cognitive (conceptual) position and function of time, particularly with reference to space. And finally, what kind of methods can be used to examine the ways the experience of time and conceptualizations of time are expressed in linguistic form.

There exist at least a few main areas of difference between space and time. Directionality of time is considered in physics not to be the property of time itself but rather a property of (thermodynamic, etc.) processes in time (Callender_FQX.pdf p. 2). While space as w know it has three dimensions, time is unidimensional. There is

1 Research carried out within COST Action TD0904 *TIMELY*, supported by National Science Centre (NCN) grant No. UMO-2011/01/M/HS2/03042, *Perception of Time as a Linguistic Category*.

also the metrical difference between space and time as well as the experience of absence of the 'free mobility' within time, contrary to space, although the latter lacks support in Einstein's Relativity Theory. Furthermore, even when one talks of spacetime, with four dimensions, three – spatial, and one – temporal, the three spatial dimensions would be distinct from the fourth – temporal sub-dimension, constituting a distinguished sub-space of spacetime, where space is not used in the usual geographical sense but it is understood rather as a mathematical construct of *a space of events* (see Minkowski 1909).

It is hoped that a discussion of the linguistic expression of time can shed some light on the problem of getting to the nature of what time is[2]. Psychologically, for a human being and language user, time and space are not synonymous even though most of the linguistic resources as used to talk about space can be taken over to express the temporal dimension.

Time as a concept

Time is not understood directly. It is a very special concept which, unlike many other concepts in language, does not belong precisely either to the category of concrete objects, i.e., objects which have their reference in the actual world, or, unambiguously, to the class of abstract objects, whose referents are mental representations only. Time is both physical – we see the consequences of the flow of time and changes it reveals, and mental – there are no extramental time representations or referents available in the physical world. The problems with time representations and temporal meanings are remedied by language users via metaphoric thinking (Lakoff and Johnson 1991). We liken time to other, better understood, physical objects and by using these different kinds of mapping of the physical objects and their properties from one or another Source Domain onto the less precisely known Target Domain of time, i.e., by using metaphor, we make an attempt to illuminate the intangible concept of time.

Temporal expressions are used in language to describe *events* or express their structure (Lewandowska-Tomaszczyk 2011). A content analysis of temporal expressions is performed here under the cognitive assumption of *iconicity* between form and meaning, i.e. the existence of a special relation of *resemblance* or *correspondence* between a structural pattern in which a temporal expression is used and the conceptualization (meaning) it conveys (Langacker 1987, 1991). The overall purpose in the present paper is to highlight some conditions on the use of the temporal units in language and their metaphoric representation (Lakoff 1987). A discussion is also presented on what can be called *fully elaborated temporal expressions* in event structure as opposed to their *reduced* versions as well as their contri-

2 The main theses presented in this paper were discussed at 1. International Workshop of COST Action TIMELY TD 0904, October 2010, Athens

bution to what I call (Lewandowska-Tomaszczyk 2008) *asymmetric events* in language. An interpretation of the temporal framework in their respective event structures is also proposed.

Methods and materials to study time in language

In order to see how different types of temporal expressions are distributed in language I resort to large collections of linguistic materials combined in *language corpora*, in this case, the British National Corpus for English (100 million units) and, whenever is needed for contrastive purposes, the National Corpus of Polish (www.nkjp.pl) for the Polish examples, parametrized to a comparable 100-million word subcorpus. For practical purposes smaller amounts of data, in 15-million word Longman Corpus and a comparable 15-million unit Polish sample will be also used. By applying the *Wordsmith* corpus tools (Scott 1997) , *concordances*, i.e., all examples of a word or phrase in context, are automatically generated from these large collections of texts, representative of spoken and written media. To investigate the frequency of contextual patterns which are used in language with reference to temporal expressions in different discourse types, other corpus tools are also used. The contextual patterns cover *clusters of words*, i.e. the most frequent word combinations, *collocations*, understood as a sequence of words or terms that co-occur more often than would be expected by chance, and *keywords*, which uncover the internal structure of a particular discourse. It is assumed that a contrastive analysis of such patterns across languages (e.g. English and Polish) may reveal more on the cognitive mechanisms in the conceptualisation of temporally-grounded events.

How time is expressed in language

Time and temporal representations are variously expressed in languages. There are Nouns first of all, whose meaning encode temporal concepts or some of their components such as the word *time* itself, which in English displays a range of senses (see Section 5), or different time units like *hour* or *second*, *month* or *year*, or *fortnight*, not necessarily found in other languages. There are Adjectives, whose meanings can be directly time-bound like *early* or *old*, or less direct like *fast* or *new* or *bald*, with the presuppostional content pointing to a prior opposite state of affairs (*having hair* or *expected to be covered with hair*). We find also corresponding or monocategorial Adverbs of Time (*tomorrow*), Frequency (*seldom*) or Manner (*hastily*), expressing a temporal dimension more or less directly. Verbs can cover whole Events (*I had dinner with them last night*) and talk about processes (*The plant is growing*), states (*Tom is old*) or other types of action (*Peter climbed the hill)*, clearly temporally constrained. A whole range of prepositions, either uniquely temporal like *during* or, more often, spatial-temporal such as *at*, *in* as well as some pronouns (*when*) and conjuctions (*while*) can cover some temporal dimensions ei-

ther explicitly or implicitly (*furthermore*). There are smaller linguistic units such as (bound) morphems, most notably affixes, which have the temporal nature and combine with other major linguistic categories. There can also be identified more complex temporal constructions, phraseological and clausal, such as *in two weeks' time* or *When I see you next time...* which introduce temporal phrases and temporal antecedents.

Lexical - morphological level

At the lexical-morphological level there are ranges of words (free morphemes) and prefixes (bound morphemes) including a temporal meaning element either uniquely pointing to a state change or profiling a process or having a temporal dimension as a presuppositional content.

It is interesting to note how such a temporal dimension surfaces both in a lexical item and in the lexicographic definition of each of its senses. Let's take the adjective *new* as an example (ex.1). In a dictionary definition of *new* (*The Free Online Dictionary* by Farlex), an old form *newo-* from the Indo-European roots, which devloped into contemporary linguistic forms in numerous languages (Middle English *newe* < Old English *niwe*, akin to German *neu* < Indo European **newos*, new (< base **newo-*) > Latin *novus*, Greek *neos*, Welsh *newydd*; Polish *nowy*; Russian *novyj*), fourteen senses of *new* are identified in its adjectival function. Both the fourteen seses and their definitions cover a temporal expression and a temporal meaning (in bold):

(1) new
Having been made or come into being only **a short time ago; recent**: *a new law.*
Still fresh: *a new coat of paint.*
Never used or worn before now: *a new car; a new hat.*
Just found, discovered, or learned: *new information.*
Not **previously** experienced or encountered; novel or unfamiliar: *ideas new to her.*
Different from **the former or the old**: *the new morality.*
Recently obtained or acquired: *new political power; new money.*
Additional; **further**: *new sources of energy.*
Recently arrived or established in a place, position, or relationship: *new neighbors; a new president.*
Changed for the better; rejuvenated: *The nap has made a new person of me.*
Being **the later or latest in a sequence**: *a new edition.*
Currently fashionable: *a new dance.*
New in **the most recent** form, period, or development: *new advances in biochemistry.*
Inexperienced or unaccustomed: new at the job; *new to the trials of parenthood.*

In its adverbial function too the form is used in the temporal sense of an action or state
Freshly; recently and often used in combination: *new-mown* (also *newly-mown*).

Prepositions

Prepositions, i.e. words which typically are syntactically combined with Nouns in language, are an interesting part of speech for us as they are used in numerous languages to describe both spatial and temporal meanings, pointing to the ubiquity of the *time as space* metaphoric relation in these systems. To take an example of the preposition *at* in English, a*t* can be used in the temporal (zero-dimensional, punctual) sense as in *at 3 o'clock* as well as in the spatial, here locational punctual, sense as in e.g., ***at*** *school*. Other examples cover spatial – temporal forms such as the motion units *towards, to* or *after*, some of which are two-dimensional like ***on*** *the table* (spatial) and ***on*** *time* or ***on*** *this day* (temporal), some others expressing the 3-dimensional meanings such as *in* (***in*** *the bottle*; ***in/within*** *a week's time*). This is one sign of the omnipresence of the parallelisms in the time as space perception even though the particular prepositions would not hold the same metaphoric force in all languages. The English spatial/temporal *at* will not have an exact equivalent in Polish, in which the preposition *o* lit. 'about' (*o 3-ej godzinie*) will be used for the temporal meaning, while the preposition *w* lit. 3-dimensional 'in', is employed for the spatial senses in these cases. Metaphorical Mapping Theory, in which various Source Domains can be mapped on the Target Domain of time will be discussed in Section 7.

Smaller units of time: affixation

Both prefixes and suffixes, i.e. morphemes attached to word stems and forming new words with them can have a temporal semantic character. Greek *Protochronia* (Greek New Year's day) employs the prefix *proto-* in the sense of the English sense element *before*. Other prefixes of this kind include *pre-, post-, inter-*. One can also argue (Lewandowska-Tomaszczyk 1996) that the whole class of *negative affixes* such as *de-* (*deregulate*)*, re-* (*rewrite), un-* (*unfriendly*) or the suffixes *–less* (*motionless*) and the combining form *–free* (*coffee-free*), etc., constitute a class of *temporal* logic category as they have to necessarily involve the *logic of change* (from state-of-affairs *-p* to its opposite state-of-affairs *p*).

Some of the prepositions mentioned above combine with verbs in English and new verbal forms are coined, also in the temporal meanings denoting e.g., a (temporal) excess as in SPATIAL *over (the fence)*, TEMPORAL *over (three hours)* and TEMPORAL EXCESS *to overstay*.

Grammatical level

Time and grammatical categories: Tense, Aspect and Aktionsart

There are two basic grammatical categories in the majority of Indo-European languages, which are directly related to time and temporal relations. They are *Tense* and *Aspect*.

The Past Tense, describing things and events remembered, can be regarded as a way to convey experience and knowledge in the process of cultural transmission. The Future Tense involves expressing both our feelings and emotions, as well as hypothetical visions and predictions (Fleischman 1982), so it is partly associated with the expression of our attitudes (*I shall/I will*). The Present Tense, on the other hand is associated with things observed directly, the attentional locus as seen from a hyper-plane in space-time, as Fleischman puts it, and can be left unmarked in many languages, with the strongest position attributed to the Past Tense.

On the other hand, there are languages like *Mwera* (southern Tanzania) and *the seventeenth-century French* (Bybee et al. 1994) which include so-called *hodiernal tenses*, expressing the actions performed on the current day (*hodie* Lat. 'today') either in the present moment, past or future time. Additionally, there are also in these languages a *post-hodiernal tense* (a future tense for events that will occur after the day under consideration) and a *pre-hodiernal* past tense for events that occurred the day under consideration. It is interesting, and somewhat paradoxical in the context of such finegrained distinctions, to note Albert Einstein's opinion, rooted in his undivided and indivisible spacetime: "the separation between past, present, and future is only *an illusion, although a convincing one.*" (a letter to the family of Einstein's friend Michele Besso, after his death see Medicus 1994; emphasis added).

Other linguistic categories which involve temporal relations, although more explicitly in terms of the internal structure of an action lingistically expressed, are *Aspect* and, connected with it, *Aktionsart*. Aspect is considered an important property in language systems. There are languages (Chinese, American Sign Language) with no grammatically expressed tense but with a clear Aspectual marking. While Aspect refers to the type of action grammatically (i.e., morphologically or syntactically) expressed, *Aktionsart*, known also as the *lexical aspect*, can be expressed semantically only via the meaning of a given lexical form.

In English, the grammatical expression of Aspect is rendered via complex Perfect and Durative (Progressive, Continuous) forms of the Verb. The Perfect forms are differentiated with reference to the completeness of an action, so the Past Perfect or Future Perfect describe events which are finished, completed. The Durative Aspect in English on the other hand refers to those activities, actions, etc, which are on-going and unbounded such as *I'm writing an essay* or *She's shouting at her children all the time*. The *boundedness* dimension (Langacker 1991) is marked in languages either via the syntactic structure as in English or is inherent to the verbal categorisation as in Polish, which distiguishes between Perfective (completed) and

Imperfective (incomplete or unmarked) types of verb e.g. *napisać* 'to write up (completed)' and *pisać* 'to write/to be writing'.

The boundedness of the action can also be marked by prepositions such as *up* in English, e.g. *to eat* versus *to eat up*, where *up* can function as a resultative marker as seen in the contrast between *to dry* and *to dry up.* Other types of Aspect, present in Slavic but not present in English, is the morphological marking of the iterative action as in Pol. *jadać* 'to eat regularly' or *widywać* 'to see regularly'. Boundedness is also marked by prepositional phrases as in : *He wrote the essay* ***in half an hour****.* Actions of different types inovolve the property of *change*, parallel to *temporal change*, expressed in semantics either by the Verb form or, as in the last example, modified by means of adverbial expressions. The contribution of these time modifiers is evident in examples such as:

(2) He read the book IN 3 hours (completed)
(3) He was reading the book FOR three hours (incomplete or unmarked).

Aktionsarten, i. e. types of action lexically marked, are visible in the English contrast between the causative *kill* and its corresponding resultative *die* or between the processual *to develop*, stative – *to be tall* and the punctual – *to break.* In the languages without morphologically marked Aspect, various forms of Aktionsart will be frequently used.

Sequence of tenses

Linguists' engagement in time is usually connected with viewing 'real' time on a line expressing the sequence or ordering of eventualities (Taggart's 1908 B-series), i.e., with grammatical tenses. The temporal relationship relationship identified in complex linguistic constructions is expressed in terms of the so-called *sequence of tenses*, which refers to the linguistic expression of time in the superordinate (main) clause and in the subordinate construction. Languages express this relationship in different ways. English, like Latin before, requires that the tenses used in the main clause and the subordinate clause express the relation of co-temporality by means of the same basic tense in the two clauses ((4) *John* ***told*** *me that he* ***was not feeling*** *well* – Past (Simple) in the main clause and Past (Continuous) in the subordinate clause), the relation of temporal priority - by one of the Past tenses ((5) *John* ***told*** *me that he* ***had not been feeling*** *well the day before*), and the relation of posteriority - by one of the forms of the Future-in-the-Past ((6) *John* ***told*** *me that he* ***would not be coming*** *here next week*). Polish and other Slavic languages on the other hand do not express the temporality relations in terms of the relationship between the actions expressed in the main and subordinate clauses but rather with respect to the time of utterance production, i.e., in terms of the relationship between the speaker's

time and the time of the action referred to in the clause. The same thoughts expressed by the English structures above would have the following form in Polish:

(4a) Janek *powiedział* (Past Tense) mi, że nie *czuje się* (Present Tense) dobrze
(5a) Janek *powiedział* (Past Tense) mi, że nie *czuł się* (Past Tense) dobrze wczoraj
(6a) Janek *powiedział* (Past Tense) mi, że nie *przyjdzie* (Future Tense) w przyszłym tygodniu

A discussion as to which types expresses a more 'natural' sequence of events is futile, as it is rather a question of a different *temporal time of reference* than a relationship with a 'real' time. Thus, what we observe in some languages is grammatical marking of the mutual temporal relationship between the main and subordinate clauses (English) as opposed to a different perspective on the same event assumed in Polish.

Utterer's meaning, utterer's attitude: time as modality

Besides so-called 'real' time, one can look at the language user's psychological or 'internal' time (Taggart's 1908 A-series), which does not represent the outside world directly but rather indirectly, also subjectively, vis-a-vis a constantly changing, dynamic background, in which the present is immediately transformed into the past and the future becomes the present. This conception of time then can be looked upon and captured not necessarily via a system of more 'objective' tenses (even though the tenses are not really 'objective', they are in large part culture-specific, and partly a conventional category of grammar) but rather through the lenses of more subjective utterer's attitude toward the content of his/her utterance. In other words, it is not necessarily the grammatical category of Tense but rather *Mood*, which expresses a *modality of a proposition* that indicates the attitude of the Speaker towards this proposition, which will be the perspective that can be adopted to perceive time and temporal relations. The Speaker can either convey some information on facts and events (*Indicative Mood*), s/he can ask about something (*Interrogative Mood*) or order the interactant to do something (*Imperative Mood*) or else express some wish, will or preference (*Optative/Subjunctive Mood*). The Speaker also expresses his/her attitude towards the possibility or probability as well as the necessity of various scenarios or else conveys information on abilities or capabilities of others. Examples such as the ones below are expressions of different moods and modalities:

(7) He can dance (ability)
(8) I might have lost it somewhere (possibility/probability)
(9) Shall I see you tomorrow? (question/necessity)
(10) Please, close the window. (order)
(11) I wish I were you. (wish)

The relationship between time and modality has been a subject of numerous studies in linguistics and philosophy but a particularly interesting theory has been put recently forward by Katarzyna Jaszczolt (2009), who presents a series of arguments from the Indo-European and non-Indo-European languages, proposing that what is considered linguistic time and temporality are in fact manifestations of degrees of modality, particularly *epistemic modality* expressed by a speaker with reference to the events identified in the utterance. Time then is in fact an expression of degrees of acceptability of or attitude towards the (past, present, future) events, similar to the semantic category of *evidentiality*, explicitly present in numerous linguistic systems and, similarly to this category, dependent on the strength of available evidence.

The strength of evidence also plays a part in differentiating the past time, most familiar and best known to the user, with the future or even the present moment. No wonder then, that languages first of all develop the category of the Past in their systems and relegate the Futurity, like the English language, to more modally-expressed patterns. As to the Present Tense, this category can quite frequently be left unmarked to accommodate parts of the Future (*I go to Paris next month*) or Past events (*I go to Paris regularly*).

Polysemy of the form *time* in language and definitional properties of the meaning of *time*

Polysemy is a lexical-semantic relation between originally distinct but related meanings of an identical linguistic form such as e.g. between two senses of the form *bright* referring to a property of emitting or reflecting light, also shining, and the other to a quick-witted or intelligent person. One manifestation of polysemy, dubbed natural polysemy, holds between different readings of the same form in the sense of its different facets and properties as e.g., between various senses of the word *university*, which can refer to an institution of higher education, (academic) staff members, students, buildings, vice-chancellor, senate, faculties, and so on (Lewandowska-Tomaszczyk 2007). The English form *time* too is polysemous in this sense. The three questions below exemplify the use of the form *time* in three different meanings:

(12) How many *times* did you go there?
(13) What *time* is it?
(14) Do you have any *time* to do that?

A dictionary definition of *time* (e.g. OED, Free Online Dictionary) would tell us that time is understood as a number of distinct senses:

- a nonspatial continuum in which events occur in apparently irreversible succession from the past through the present to the future. *I have some time*
- an interval separating two points on this continuum; a duration; *from time to time*
- a number, as of years, days, or minutes, representing such an interval *in 3 years' time*
- a number representing a specific point on this continuum, reckoned in hours and minutes *What time is it?*
- a system by which such intervals are measured or such numbers are reckoned *East American time*

Polysemy is a language-specific phenomenon, so one cannot find the same type and number of meanings relating to an equivalent form in another langauge. The English *time* in the senses identified in examples (12) – (14) have their equivalents in Polish in the form of three distinct words, which would have their prototypical English equivalents in the form times 'razy', hour 'godzina' and time 'czas':

(12a) Ile *razy* byłeś tam?
(13a) Która *godzina?*
(14a) Masz *czas*, żeby to zrobić?

Each of the senses in the polysemous cluster of *time* can also have lexical realizations in the same language. For instance, a time interval can be called *a break*, continuity can be dubbed *duration* or *process*, a system can be expressed in *hours*, *minutes*, or *months* and *millenia*, etc.

Time then is conceptualized as a (spatial) line analysed as succession but also as a point or interval. The temporal language exemplified here can help us identify the main definitional properties of the concept of *time*. It is either *nonspatial, unbounded continuum* or *a specific point on this continuum*, it refers to (apparently irreversible) *succession*, *an interval* or *a number* which represents it. It can also represent *a system of such intervals*.

Time and time units: Language and culture

The polysemy of the unit *time*, specific to a language system, was shown above, while the contribution of wider, culture-specific elements to the interpretation of time is visible particularly in the *segmentation* of time into different units. Culture-bound aspects of such distinctions can be observed, for instance, in the definition of what constitutes a *weekday* as opposed to a *weekendday*, in the dividing line between phases of the *day* and *night*, which can also extrapolate on various pragmatic and culture-specific rituals like greetings, distinct in different cultures.

The distinction between *weekdays* and the *weekend* runs in different cultures parallel to the historical and religious conditioning. A *weekday* is defined in an enumerative manner to be one of the days of Monday, Tuesday, Wednesday, Thursday or Friday and, as analysed in terms of culture-sepcific ontologies of time-units (Özden 2004), the definition of a *weekendday* concerns one or both of the two days of Saturday and/or Sunday in Catholic countries. In Muslim countries Friday is the holy day so Thursday and Friday are considered *weekenddays*, while, after a reform, in a number of Musilm countries of Persian Gulf the weekend covers Friday and Saturday. In some (e.g. Iran), the weekend is a single day, Friday. Turkey, for example, officially using the Gregorian calendar, has the official weekend days on Saturday and Sunday, but a number of the inhabitants consider Friday to be a *weekendday* too.

The differences are also observed in the structure of the week. In the majority of European countries the first day of the week is Monday. In Israel though, as well as in some predominantly Muslim, countries, Sunday is not a *weekendday* but it is the first *weekday*.

Cultural time ontologies also answer questions as to when exactly a day and a night start there, what are dawn, afternoon and evening, and accout for such *antonymous polysemies* (see Lewandowska-Tomaszczyk 2007) as *twilight* in English, in which twilight is both the time between dawn and sunrise, and the time between sunset and dusk.

The categorization of time into units influences certain pragmatic conventions such as arrival and departure greetings as e.g. *Good evening*, which can be used both on arrival and departure in English, while the equivalent greeting *Dobry wieczór* 'Good evening' in Polish can only be used on the evening arrival, with *Dobranoc* 'Good night' employed exclusively on later departure.

Conceptualizations of time: metaphors

The form time occurs in 28,765 concordances in the 15-million word Longman Corpus. The examples include various modifiers of time (*stable time tonight, spring time*) and temporal prepositions and phrases (*at..., every...*):

(15) 'At stable *time tonight* Nashwan was found to have a temperature of 102,' Hern said.
(16) I mean young women, strong enough to breed like the cows every *spring time* and dig the fields in between

There are also *time*-clusters in the materials with the frequecies of occurrence indicated by the numbers which follow:

(17)

1	THE SAME TIME	1 220
2	AT THE SAME	1 142
3	THE FIRST TIME	1 097
4	AT THE TIME	907
5	FOR THE FIRST	797
6	A LONG TIME	656
7	ALL THE TIME	627
8	TIME TO TIME	613
9	THE TIME OF	612
10	FROM TIME TO	611
11	BY THE TIME	554
12	AT A TIME	458

The concordances of the form *time* from the Longman Corpus present a picture of the abundance of primarily non-literal expressions employed in English to talk about time:

(18) *Time reached away behind and ahead*
(19) *Time should be given* to explore further possibilities
(20) *Time should go faster* the closer you were to a clock
(21) *Much time should be taken* to define and delineate the problem

Equally revealing is a list of collocations in which the form *time* is a part. They point (directly or indirectly) to the Source Domains which have been used to describe and interpret the concept of *time*. The master metaphor for TIME invariably involves MOTION and CHANGE in SPACE. The data also foregrounds a number of HUMAN (Agentive) Source Domains and another prevailing metaphor of *time* as a VALUABLE COMMODITY. The collocations (nominal, verbal: basic forms and participles, adjectival) exploit *parts* and *elements* of the whole Source Domains. They are listed in (22) according to the Source Domains. The items in the lists within each category are put in the decreasing order repeating the frequency of

occurrence of individual items in the corpus materials so e.g. in (i) *long* is the most frequent and *backward* the least frequent collocate used with *time* in the data:

(22) Source Domains for TIME (source: Longman Corpus 3858 collocations)
[t stands for 'time'; brackets indicate that the collocate appears within word-span larger than 1 word]

(i) SPACE
long t
short t
length of t
small t
little t
less t
high t
t point
leave t
book the t
brief t
increasing t
miss 1 the t
larger t
lower t
growing t
greatest t
t occupied
external t
extended t
t elapsed
t span
developing t
winding t
distant t
delay [SPATIAL etymology]
t limits
successive t
backward t

(ii) PHYSICAL OBJECT
(iiia) flowing water
water [t]
current t
t flow
t flowed
fluid t

(iib) motion, flying
flying t
t passed 1

(iiic) flight

(iid) eating
t devours

(iib) (valuable) commodity
take t
waste(d) t
t found
t used
left t
give t
saw t
find t
t change t
need t
have
passed 2 t
real t
reached t
giving t
available t
considerable t
save t
keep t
won t
reach 1
showed t
provide t
catch t
produced t
bought t
miss 2 t
expensive t
added t
t values
broken t
management t
bound t
valuable t
covered t
managed t
forgotten t
harvest t
precious t
gain t
t machine
observed t
formed t
fill t
requires t
acquired t
demand t
rising t
indicated t
provides t
t permitted
t destroys

(iib - 1) EVALUATION
good t
wrong t
relative t
perfect t
effective t
odd t

(iii) ANIMATE: PERSON
t called
Father Time
t run
t passed 2
t reach 2

death [t]
t comes
recognized t
expected t
t exist
t ran
standing
stirring t

(iiia) ENEMY
beat t
killing t
killed t
fighting t
followed t

(iv) HARM/SIN
forgiven t

(v) ILLNESS
suffered [t]

(vi) EMOTION
t felt
t missed

(vii) SOUND
told the t
hear t
t mentioned
t expressed
t tells
t recorded

(viii) KNOWLEDGE
remember t

(ix)ACTION
end t
began t
start t
t allowed
free t
t happened
changing t
alter t

(x) CYCLES
early t
morning t
t interval
bed t
single t
regular t
final t

(xi) MEASURE
systemclock t
head [t]
face [t]
clock [t]
t unit
measured t
established t
count t
t scales

There are also other figurative expressions used, as e.g. employing metonymic phrases (i.e. involving some part of an object which is mapped on the whole object) as in e.g. *active/busy time*, or *quiet time* in which the adjectives *active/busy* and *quiet* refer to the way an individual can spend the time. The categories listed above in (22) are not always mutually exclusive, e.g. the category (VALUABLE) COMMODITY can include the form *harvest*, whose Source Domain is AGRICULTURE, more precisely, crop gathering, the Source DOMAIN for the VALUABLE COMMODITY *time* interpretation itself.

The corpus methodology used, enriched with the Cognitive Linguistic metaphor interpretation, uncovers similarities and differences in the linguistic patterns used to denote temporal information. A cross-linguistic method of this type has also been used to uncover the similarities between English and Polish in the use of the metaphoric Source Domains. Left undiscussed in the present paper are statistical methods which are used to extract adverbs of time, such as *quickly*, *slowly*, which function as *node words* in collocations such as *become quickly apparent*, *slowly shifting attitudes*.

A general classification of TIME conceptualizations in language

Humans metaphorize things and events which are abstract. We map SPACE on TIME, we map concrete, physical objects, their functions, behaviour and properties onto the concept of TIME. The processes of mapping less familiar and less fully understood concepts on human properies and the human body is related to the nature of the human mind, which is largely determined by the form of the human body, i.e. with *embodied cognition* (Lakoff and Johnson 1999; Lakoff and Núñez 2000).

The basic Source Domain for time conceptualisations comes from the static and classificatory Linnaeus's system, operating within a 'circular' time: repetitive happenings within a closed system. A challenge to the dominant Classical Newtonian Time Paradigm (McGrath and Kelly 1986) came from *nature*, more precisely from the natural physiological/physical *cycles* and *rhythms* within an organism. The Biological Transactional Time Paradigm as it is known, is a paradigm which incorporates the concept of biological entrainment, i.e. mutual synchronization between various, mostly circadian, rhythms within human organism (Aschoff 1965, 1972; Pittendrigh 1965, 1972). Numerous analyses (Kosecki 2008) of manifold everyday expressions related to the concept of time justify the conclusion that various biological rhythms, such as sleep/wakefulness, activity/rest, and temperature are reflected in language. Cycle metaphors such as LIFE IS A PLANT, A LIFETIME IS A YEAR, A LIFETIME IS A DAY (Lakoff and Turner 1989) *the spring of his life*, *at the dawn of her life, at the wake of his life* reflect the idea of entrainment between two independent cycles, e.g. the cycle of life and the cycle of a year/day/daily routine. This form of entrainment, as the authors propose, are structurally akin to the biological entrainment: "steady-state", "leading-phase", and "lagging-phase". Gärdenfors (2000: 7) refers to languages with a circular time representation and notes a new paradigm, in which an IE family of languages exploits a new system, i.e., its common ancestry in terms of *dynamic causes and changes*, where time is understood as 'linear' and oriented: forwarding towards new states and changes.

TIME in SPACE

Although - as will be evident from the subsequent discussion - there are far-reaching analogies between TIME and SPACE, the basic difference between the conceptualisation of Space and that of Time is the element of *motion* in the latter and its absence among the basic parameters of *space.* Motion disappears in the conceptualization of the *present* time. The concept of *the present*, i.e., *here and now*, has the element of stasis and punctuality. Time also stops, freezes, in some particular moments of great emotion, excitation or catastrophe. The metaphor TIME is MOTION in SPACE is a master metaphor in all known world languages. The motion though is a DIRECTED motion.

Time as motion in space: Orientation

In the Newtonian paradign, in agreement with the common sense, the fundamental notions of matter, space and time were all separate and fundamental. And yet, language users, as if foreseeing the Einsteinian concept of Spacetime, and combining space and time into a single continuum, tend to perceive basic similarities between time and space and conceptualize time in terms of space.

The SPACE metaphor, one of the prevailing sources in our corpus data, is not uniform in all languages. Languages differ in the ORIENTATION of time understood as SPATIAL direction. Spatialization metaphor for time is language- and culture-specific as far as its orientation and direction are concerned. First of all, there are two possible dynamic metaphoric models: the first one, as in *Months rotated*, expresses a cyclic movement of TIME and the other - in which TIME is a moving entity along a line. The motion can either be towards us, facing us (*Christmas is coming*) or in the direction away from the Speaker or else it involves the DOWN to UP or UP to DOWN orientation.

Another distinction in metaphoric conceptualization involves the moving entity. The first portrays the moving EGO and the stationary time, which can be exemplified with *The exam is before us*, where the phrase *before us*, similarly to a spatial arrangement, can indicate a point in space (*the exam*) and the EGO (*us*), moving towards a stationary point. In the sentence *I came back to my past memories* EGO is moving towards the past and *I'm going to see you tomorrow I* is moving forward towards the next day.

In the second framework it is TIME which is moving towards or away from EGO as in *Christmas is coming* or by EGO *As time went by*. Additonally, the motion of time tends to be visualised as a left-to-right directed arrow (Santiago et al. 2007).

The *orientation* parameter can also vary with respect to either *face-to-face* perspective, in which the Speaker faces the flow of time, as in the majority of European languages or, less commonly found, other perspectives like the *in tandem* perspective, identified in Hausa and other West African languages, used for objects of comparable size in a constructed aligned perceptual/conceptual field (cf. Radden 2004).

The examples above present models of time, in which the future is before us and past – behind.

There are models used in other languages, in which the positions are reverse. In the Aymara language in central Peru, Bolivia and Chile, it is the future which is behind us – as we can't know it, we don't see it – and the past – familiar and domesticated - stands up fairly statically before our eyes. Similar orientational metaphors for time have been reported for Aramaic and Hebrew and some East-Asian and African languages (e.g. Malagasy, see Radden 2004). Rafael E. Núñez and Eve Sweetser (2004), who described Aymara, also provide evidence of the gestural support for this orientation from the conversational materials in this language.

Still other spatial construals of time, i.e., expoiting the *vertical* rather than *horizontal axis*, are found in languages such as Chinese or French, in which *earlier periods* can be located in the higher directional levels (UP) and *later time* is perceived as lying DOWN or LOW as in French *Basse Aniquité* lit. 'Low Antiquity' used in the sense of Late Antiquity. The Chinese use both the *front-back* as well as the *vertical* spatial orientation to talk about time e.g. *shànyuè* lit. 'up.month' equals 'last month' and *xiàyuè* lit. 'down.month' denotes 'next month' (Yu 1998).

Metaphors: properties of time

The list of Source Domains for TIME generated from the Longman Corpus collocations reveal other essential properties of the human time conceptualizations. Metaphors related to time and economics, e.g. TIME IS MONEY *don't waste my time* uncover TIME as a valuable commodity or a GIFT (*I'll give/offer you some time*), various personification metaphors of time, e.g. TIME IS CHANGER as in *time is catching up with him* lend us lenses to see TIME as a ruthless causer of changes. What follows is that TIME can also be ENEMY (*to kill time*), PREDATOR (Tolkien's riddle on time: *"This thing all things devours: Birds, beasts, trees, flowers; Gnaws iron, bites steel; Grinds hard stones to meal; Slays king, ruins town; And beats high mountains down."* Hobbit V:84) or PRISON and SLAVE MASTER (when we talk of a *time slave*). *Time is floating away/flowing* uncover the conceptualization of TIME as OBJECT (reification) or EXPERIENCER (personification). TIME IS ARROW shows TIME in terms of a stationary sign symbolizing the direction in SPACE. When the conceptualization represents a dynamic object, *time* is thought of as *flying* (in the air).

Metaphor as a window to mind also has its function in sign language. Metaphors and metonymies of time in signed languages (Wilcox 2000, 2002) such as American Sign Language (ASL) and other world sign systems contain many signs whose articulation parameters reflect the basic metaphors such as TIME ORIENTATION.

Time and event structure

Time is connected with *happening*, with *change* and *events*. We observe time due to our judgement concerning *possibilities and probabilities* of the occurrence of events in this sense time is *modality* (e.g. Jaszczolt 2009). Repeatedness and cycles undelie our predictions and expectations. A working definition of *time* describes it as a sequence of moments in a linear order and, in fact, the logic representation of time in the event structure, proposed by van Wright in his Logic of Time, also referred to as the Logic of Change (van Wright 1963), follows this definition. Verkuyl (1993) represents an event construal in terms of the following linear sequence:

(23)

Event construal

$f_{\text{walk home}}$ = (<t_0 office>, <t_1 book shop>, <t_2 office>,<t_3 bar>, ...,<t_n home>]

$f_{\text{walk to X}}$ = (<0,*l*(0)>, (<1,*l*(1)>, (<2,*l*(2)>, ...,(<4,*l*(4)>,..., (<m,*l*(m)>)

```
DL  l(0) l(1) l(2)  l(3)
     ↑   ↑   ↑   ↑
IV----------------------------------------------->----
     0   1   2   3
```

The Path-structure of *John walked home* can be represented by a function from indices (natural numbers) into a domain of locations, in particular a domain of spatio-temporal locations.

Perception and conceptualization of events

Similarly to the structure of objects and their categorization there exist two hierarchical organizations for events: *taxonomies* and *partonomies*. This organization has been studied by activity segmentation tasks during its duration and it was observed by Zacks and Tversky (2001) that the structured representation of events is linked to *goal* and *cause* relationships.

Although events are perceived similarly to objects in that they have their parts, they, unlike a majority of objects, have a temporal dimension. The subjectivity and the role of mind in demarcating events is clearly visible in experiencing the length of events, their boundaries as well as the possibility of binding smaller events into one more complex meta-event in the blending process.

Notwithstanding the diverse classifications of events, with some of them excluding some human activity forms from the Event category, the fact remains that different types of action, activity, process or state can be perceived and *conceptualized as (more or less prototypical instances of) events* and linguistically marked accordingly. The categorization is clearly dynamic in this respect and is subject to various *shifts* (cf. Verkuyl 1995), constrained by *aspectuality* frames as expressed linguistically. To what extent the shifts can be observed at work is exemplified by the interpretation change of the following sentences, discussed by Verkuyl:

(24) *John pushed the cart*

(25) *For hours John pushed the cart* - indeterminate as to the result, may be repetitive, may be with no overt move

(26) **For hours John gave the cart a push* - unacceptable in resultative reading
(27) *John pushed the cart away* – assuming resultative reading

Verkuyl calls this phenomenon *shifts in perspective* and proposes the following (1993: 282): "speakers may shift their perspective....the sentence *The soldiers came into town* may pertain to one event in which say three soldiers came into town, but also to a situation in which an unspecified number of a given category came into town. The difference between the two interpretations also corresponds with *the difference between terminative aspect and durative aspect.* This can also be explained in terms of perspective if one realizes that different indices, that is, different points of perspective, may be used, leading to different interpretations for apparently similar structures."

In his *Theory of Aspectuality* Verkuyl explains *aspectuality* in terms of an opposition between *terminative* aspect and *durative* aspect, and describes the way in which terminative aspect is formed on the basis of semantic information expressed by different syntactic elements, in particular the verb and its arguments. Relevant here are also factors of *telicity-atelicity*, i.e. a meaning parameter denoting a goal or an end-point, as well as adverbial quantification. The aim is to determine which semantic conditions make a sentence terminative e.g.:

(28) *I read a book for 3 hours*
(29) *I read*
(30) *a book in 3 hours*

It is thus assumed that any human experience can be considered an event (cf. Siewert 1998) provided a language user perceives it as such and imposes a relevant structure on it, along with the assumption that "Token experiences are events (in the broad sense, which includes token states)", as proposed by Michael Tye (1997).

Events as they are in mind

The basic assumption in this work is that linguistic semantics is not modelling a relationship between objects and events in the real world and language which expresses them but rather relationships between objects, events and the Experiencers of *conceptualizations*. Language users can either choose to linguistically convey a decription of events by means of more prototypical structures or they can select a number of other, grammatically accessible options. Each grammatical decision is simlutaneously a decision about a different portrayal of a given scene and event.

Prototypical events

The archetypal event schema, underlying the conceptualization of a prototypical action expressed in terms of a finite clause in language is proposed to be *a billiard-ball model* (Langacker 1991), in which an energy transfer from an Agent to an Object (causation) is observed. Another model proposed by Langacker to account for more complex event-types is a Stage Model, in which, apart from the Agent (instigator of an action) and an Object (passive or transferred event participant), *a Viewer* is present, whose role is either to objectify the action (when off-stage) as in *Tom painted the house yellow* or subjectify it (on-stage) *Tom may have painted the house yellow*, or, more precisely, either to objectify or subjectify the perception of the action and use adequate language forms to account for this.

There is also a separate class of potential events such as those referred to in negative – factual and negative – counterfactual constructions (see Lewandowska-Tomaszczyk 1996), as well as hypothetical, future, and past events, built and inhabited in mental spaces i.e. *alternative realities*. In the alternative realities the temporal relations are mapped from corresponding factual spaces and marked by a system of dedicated grammatical devices (Tense, Aspect, markers of various types of subordination e.g. subjunctive in English and special complementation (*żeby*) type in Polish).

Asymmetric events (Lewandowska-Tomaszczyk 2008)

Shifts in temporal perspectives Verkuyl (1993: 282) discusses about are marked in terms of *sequential* as opposed to *summary* scanning (Langacker 1991). The sequential *John walked home* is time-marked and more granular, while the gerundive, summary-scanned form *John's walking home* portrays the same event in terms of a reified nominal, with a less detailed description of the scene and suspended temporal dimension.

A distinction between the sequential and summary representations illuminates a difference between *Fully Elaborated Events* such as e.g., *Mary was dancing* and *Reduced Events* e.g., *Mary's dancing*, *Mary dancing*, *for Mary to dance*, *dancing Mary*. Syntagmatically, in a sentence, a Fully Elaborated Event can appear with a Reduced Event as a complex of *Asymmetric Events* (Lewandowska-Tomaszczyk 2008), introduced by one of the syntactic operations of subordination or modification. The Reduced Event is expressed in one of the types of *atemporal* event structure, where time is indicated only pragmatically via the contextual clues present in the Fully Elaborated part, which imposes the temporal frame on the complex event as e.g., in *John smiled* [Past 1] *at Mary dancing* [Past 2] or *Mary's dancing* [Present 2] *is fun* [Present 1].

Temporal parameters and parts of speech

Parts of speech, such as Nouns, Verbs and their forms or Adjectives and Adverbs can be used in language to change the perspective on an event: to scan it dynamically like in a processual, sequential scene or to wrap it up as an object in a parcel and reify it, making it more similar to a Noun. They can thus function as exponents of *event asymmetry*. One could also use one of the verbal forms - a present participle – in English - and make the event more Adjective like, suspending the temporal dimension altogether and shifting the perspective from an occassional feature (*I saw a man* ***reading***) to a more constant, steady property (*He is a reading man, really*). The function of a past participle on the other hand, when used as an attribute, is to make an event bounded, i.e. temporarily completed, perfective, as in *a* ***broken*** *leg.*

A perfective process, to borrow Langacker's definition (1991) - is internally *bounded* within the immediate temporal scope, i.e. it has an onset and offset, while bounding is not relevant for an imperfective process. Relational units such as adjectives, adverbs, prepositions, infinitives, and participles designate an atemporal relation. The relations are simple (stative) or complex (comprising multiple component states) and comprise a holistic viewing of a scene (summary scanning).

Adjectives are thus typically used to designate stative properties, profiling an atemporal relation between a thing and the property. Verbs on the other hand "profile a process – the change is plotted through time in the active zone's location." (Langacker 2000: 11-12). Participles on the other hand are complex linguistic forms which retain the sequential scanning of an original verb, but which are typically profiled in terms of atemporal, summary scanning.

Subjective time. Metaphors again:Time extension / Time contraction

The language user has a choice to use forms of more 'objective' time or more 'subjective' temporal constructions, to portray a scene with less detail as a static, summary-scanned model, shrunk in the temporal dimension, or as developing on-line, fine-grained and dynamic in the sequential perspective. The language users can thus express their conceptualizations of the whole event and its temporal dimension by means of a grammatical construction. It is worth to note that by using different grammatical forms and resorting to metaphors and troponymic descriptions of subjective time the speakers point to their perception of the (shrinking or expanding) temporal axis as in e.g., *It was a real drag* or *The afternoon raced by.*

Conclusions

Grammar, metaphor and temporal dimension cross-linguistically

Grammar is semantic. It expresses the human intuition about time experience and temporal relations, with respect to placing an event in the range of past, present or future happenings (Tense markers), frequently with a clearly marked Modality (as in the Future Tense in many languages). Grammatical categories can express the properties of completeness, duration, iterativeness of an action, etc. with regard to temporal boundedness or repetitiveness (Aspect). In languages with no clear temporal marking such as Chinese, in which tense is not morphologically expressed, it is the aspectual markers that play an important role and can be intrepreted either as carriers of componential elements of tense marking in their meanings or else as a function of contextual pragmatic inferences with respect to time interpretation (e.g. Ren 2008).

Grammatical structure is symbolic of the language user's conceptualization of his/her temporal experience of an event. It can either expand the scene (e.g. imperfectivising markers in English) or make it more granular (finite clause constructions with the verb grammatical markers: person, number, gender, tense, etc.) segment, shrink or wrap it up (deverbal Nouns e.g. *the construction of the building*). The function of the grammatical structure then can be compared to that of metaphoric structures, which portray various subjective conceptualisations of *time*, e.g., either as a fast running or a slowly dragging entity.

Grammatical categories and the Linguistic Relativity Hypothesis

A discussion of the relativism introduced by various linguistic expression of time in different languages leads to a question which started an ongoing discussion not only on linguistic differences between various systems but also on the basic foundations of the theories of perception and conception. Benjamin Lee Whorf, who studied the Hopi Indian language, discovered (Whorf 1956) that the expression of the category which would be expressed as the Indo-European time (tense) relations would be rendered in Hopi rather in the forms of the category of Mood such as assertions, and Aspects, i.e. *types of an action* rather than the time in which it is performed. This turns out in contemporary research to be a natural thing to be expected in different languages rather than an extroaordinary property of human language.

The 'strong' version of the Relativity Hypothesis goes so far as to imply that the language a speaker uses imposes a network of constraints on the speaker's *perception* of the surrounding reality to the extent that s/he would not be able to understand fully the meaning of a message conveyed by a speaker of another language. The question pertains to the basic foundations of intercultural and interlinguistic communication and mutual understanding. As discussed by Whorf (1956: 58, "An