Time and TAME in Language

Time and TAME in Language

Edited by

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P U B L I S H I N G

TABLE OF CONTENTS

Part III. TAME and the Interpretation of Other Structures

PREFACE

This volume presents a selection of papers which were first presented in the I Meeting on Syntax and Semantics and their Interfaces (I EISSI, *I Encontro de Sintaxe e Semântica e suas Interfaces*), which took place in Porto Alegre, Brazil in 2011, at the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS). The general goal of this meeting was to strengthen and broaden the circles of research on formal linguistics – particularly syntax and semantics – in Brazil as well as stimulate further interest in those who have had little exposure to these theoretical areas. With the objective of focusing on a thematic topic for each edition, the first theme chosen for this event was **time**. This includes the nature of time itself as well as its manifestations in language, namely, tense, aspect, mood and evidentiality, or *TAME*. The conference shed light on the important works being done by local and national researchers and introduced to the mostly local audience some of the major lines of international research in formal linguistics.

Much of the success of the event can be attributed to the plenary speakers who were so gracious to contribute with their presence and the presentation of their latest research. The renowned quality of research by Emmon Bach, Östen Dahl, Brenda Laca and Marcelo Barra Ferreira in the syntax and semantics of time has garnered international attention and motivated Brazilian specialists in the area to contribute to the quality of the event with their presence as well. Three of the invited speakers of the meeting, Emmon Bach, Östen Dahl and Brenda Laca, are also contributors to this volume.

We wish to acknowledge the institutional support of the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS) and the School of Letters (FALE), for providing the space and incentive for the event to take place. The Department of Events (CEPUC) was actively involved in organizing technical aspects of the event, including the website and registration logistics. We are also appreciative of the Association of Professors at PUCRS (ADPPUCRS), for providing the coffee breaks during the event. The event would not have occurred if it were not for the financial support of the company *Inbenta*, with the help of Monica Monawar, and that of Ana Ibaños, both of whom are contributing to the present volume. Finally, we would like to thank Carol Koulikardi and her

team at Cambridge Scholars Publishing for providing us with the opportunity to bring this book to fruition.

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The Editors
Karina Veronica Molsing and Ana Maria Tramunt Ibaños

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INTRODUCTION

The present volume brings together research papers with a focus on the syntax and semantics of time. The purpose of this book is to advance the understanding of the nature of time as well as its corresponding categories in natural language as objects of research, namely tense, aspect, mood and evidentiality, also referred to collectively by the acronym *TAME*. The articles selected for this book demonstrate the complexity of time in language, its grammatical expressions and interpretations and its interactions with other grammatical categories[1]. The approaches assumed in the investigations here range from philosophical to formal and draw on data from such languages as English and Spanish as well as less studied languages such as Brazilian Portuguese, Karitiana and Romanian. In particular, the research gathered here contributes to various levels of investigation, which have been organized into three main research areas, presented accordingly below.

Part I. What is time and TAME in language?

Emmon Bach, in his paper "Time in language", presents an overview of how time has been analyzed from a formal perspective in a variety of disciplines such as logic, linguistics, physics and philosophy. The main question is whether analyzing the expression of time in natural language can contribute to the understanding of the questions regarding the nature of time as an object of scientific study in other disciplines. Questions on whether time exists independently of change and events, how it can be measured, whether it is discrete or continuous, linear or circular and the meaning of *now* are meant to clarify whether the nature of time is inherently absolute or relative. So, while these issues are considered philosophical stalemates, Bach believes that the language we speak and hence, the corresponding linguistic assumptions we make reflect certain metaphysical assumptions. On the other hand, those linguistic assumptions that would be philosophically contradictory, do not pose a problem for theories of time in language. For example, some linguistic theories assume the existence of events or eventualities, which reflects a relational view of time in which time itself does not exist independently of objects and events. On the other hand, there are linguistic theories that assume the

independence of worlds and times, reflecting the absolutist view of time. Bach proposes the absolute-relative dichotomy to be asymmetrical and, though language appears to be more relative in nature, it is, ultimately, flexible such that linguistic theories can be molded without having to answer such weighty philosophical questions.

The fundamental question of what is time in language is approached from a cognitive instead of a formal perspective by **Östen Dahl** in his paper "Tense-aspect-mood-evidentiality (TAME) and the organization of human memory". Dahl questions whether the categories of tense, aspect, mood and evidentiality (TAME), often grammaticalized in natural languages, are a reflection of the structure of human memory. The author proposes correlations between these cognitive structures and certain TAME distinctions found in many languages around the world. For example, the common distinction between episodic and semantic memory in memory theory involves the notion of consolidation, which is the way in which elements of short-term memory are restructured for long-term memory. Further correlations are made between remembering past experiences and evidentiality as well as memories consolidated during sleep and remoteness.

In their paper "Time and interfaces", **Jorge Campos** and **Ana Ibaños** propose an interdisciplinary framework within which time can be addressed as an object of study. They defend, according to Campos' Metatheory of Interfaces (2007), that time in disciplines such as physics, philosophy, linguistics or neuroscience, can be an object constructed to satisfy descriptive adequacy, or within an interdisciplinary framework such that the explanatory nature of the investigation is enriched by multiple views. The authors discuss the possible models that can be built depending on the disciplinary perspective(s) assumed. Shifting between models results in a shift from debating the nature of the object of study, in this case, time, to a debate on the properties of the relevant models. These shifts are occasioned by one's choice of two types of interfaces, those between and those within different disciplines.

While the expression of time is often considered to be verbal in nature, TAME comprises a broad range of grammatical categories. For example, finding temporal interpretations in noun phrases is not new (Lecarme 1999, 2004), but the relatively high incidence and diversity of finding temporal interpretations across categories blurs the division of labor between them such that straightforward definitions are no longer clear. Data from less studied languages contribute to the enrichment of existing frameworks on TAME, which eventually leads to reformulations of the foundations of these categories and their basic or minimal characteristics.

In the paper "Temporal and aspectual interpretations in non-finite clauses", author **Luciana Storto** discusses the temporal value of verbs in the Karitiana language. While verbs in this language are morphologically marked for tense in matrix clauses, the same is not true for embedded clauses. At first sight, it appears the tense of the matrix clause determines the temporal interpretation of the embedded clause since, when the non-finite embedded verb is followed by a perfective marker, it is interpreted as past. However, when this same marker is present in adverbial clauses, it is interpreted as 'when' or 'if', leading the author to question the semantic contribution of such markers. When the matrix verb is in the future, the embedded verb is interpreted as future even without any additional future marker on the embedded verb. The addition of a non-future tense suffix in the main clause results in either a present or past interpretation, depending on the context. Moreover, there is an imperfective auxiliary that cannot receive a past interpretation when in a non-finite main clause, but may do so when in a non-finite embedded clause, when under the scope of a non-future matrix clause. Given this set of data, the author suggests that tense be interpreted differently depending on the type of non-finite embedded clause, whether in adverbial and complement clauses.

Part II. The behavior of specific TAME structures

This section presents two chapters analyzing the behavior of verbal periphrases in Brazilian Portuguese: the present perfect and the progressive. In the paper "The Portuguese present perfect: An exercise in the study of plurals, events and aspect", **Karina Molsing** approaches the behavior of the present perfect in Brazilian Portuguese assuming the possibility of a compositional analysis. This involves analyzing the theoretical foundations of the elements that compose this particular structure, namely, events, plurality and aspect. The notion of plurality is included due to the structure's frequent meaning of iterativity. Durative interpretations are possible with stative verbs, though iterative readings are also easily derived. The interpretation of the present perfect structure is also influenced by the plurality of arguments. The author observes that plural arguments together with the present perfect structure lead to two dimensions of plurality, depending on whether the plural is in subject or object position. So, while plural objects trigger distribution over (sub)events within occasions, Molsing proposes that plural subjects lead to a cumulative relation between the plural subject and the plural events of this present perfect structure. This is explained by modifying the aspectual configuration of the present tense, assuming all temporal markers possess

both tense and aspect components. This alteration results in the possibility of a greater number of interpretations of the present perfect structure when compared to the other Portuguese perfects.

Roberlei Bertucci and **Marcus Lunguinho** investigate the progressive structure in Brazilian Portuguese and its interaction with lexical aspect in their paper "When the progressive and aspectual classes meet: the case of Brazilian Portuguese". As is well documented in more studied languages (Smith 1997; Laca 2002, 2005; Wachowicz 2003), the progressive structure has a different interpretation depending on the aspectual nature of the eventuality denoted by the VP, which leads to certain predictable inferences such as those outlined in Dowty (1979). In a compositional approach, the authors explain the different readings by considering the auxiliary verb *estar* to have a prepositional feature at the syntactic level, which is checked by the gerund morpheme itself. This leads to the consideration that the gerund is a kind of non-finite form with an associated preposition. The authors claim this is a welcome result as it provides a parallel syntactic-semantic explanation for the progressive structure in European Portuguese which is composed of *estar*, the preposition *a* and the main verb in the infinitive form. This framework is also capable of providing descriptions for the different interpretations that arise with the different types of verbs.

Part III. TAME and the interpretation of other categories

Frequently, research studies analyze the syntax and semantics of certain grammatical structures by investigating their behavior in particular temporal and aspectual contexts. In other words, elements of tense and aspect may influence the understanding of other TAME categories such as mood or evidentiality, or even non-TAME categories. This approach is shared by the four papers in this final section.

In **Brenda Laca's** paper on "Temporal orientation and the semantics of attitude verbs", differences in the behavior of attitudes of belief and attitudes of desire are explored with respect to the temporal orientation of their argument clauses. Due to these and other semantic and syntactic differences, Laca defends that there must be a finer-grained typology of these propositional attitudes. Differently from attitudes of belief, attitudes of preference appear to be future oriented. The resulting distribution of interpretations and restrictions leads to the possibility of analogies with other grammatical structures such as imperatives and bouletics. Laca's paper explores each possibility in turn. In essence, the author argues that the better analysis of propositional attitudes is that which better accounts

for the variations regarding their temporal behavior. In this case, Laca claims that a better understanding of the temporal orientation of attitudes of preference can be obtained when considering the inherent ambiguity of the time of the embedded clause.

Marta Donazzan and **Letícia Gritti's** chapter "*Another look at telicity and homogeneity: aspectual constraints on weak readings in two Romance languages*" addresses the topic of nominal expressions with weak readings in episodic environments in Brazilian Portuguese (BP) and Italian. In this paper, the authors observe that the acceptability of BP count bare nouns in perfective and imperfective environments varies according to the eventuality underlying the VP while durational adverbs often serve to improve the apparently unacceptable readings with certain types of eventualities. In Italian, bare nouns and weak DPs also encounter certain restrictions in episodic sentences. The homogeneity and telicity of the predicates are taken closely into account towards a better understanding of the distribution of interpretations of the expressions in question. By assuming that count bare nouns in BP and weak definite DPs in Italian are kind-denoting, the authors can explain the distinct aspectual nature of the VPs that they complement in comparison to those with bare plurals in both languages.

In a study that compares Brazilian Portuguese and English to Romanian, **Mônica Monawar**, in the chapter "Modality and the optative-conditional in Romanian in comparison to Brazilian Portuguese and English", focuses on the behavior of the modals *must* and *may* in the three languages, assuming Kratzer's (2010) approach to modal logic. The influence of tense and verbal aspect on the semantic interpretations of these elements in the three languages is also investigated. Of particular interest is the author's analysis of the optative-conditional mood, present in Romanian, but not in English or Portuguese. Among other syntactic-semantic factors, the interpretation of this structure varies according to whether the structure of the verb is in the present perfect or the past perfect form. This and other data lead the author to suggest a broadening of Kratzer's theory of modal logic.

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Notes

[1] Another source of unintended complexity arises from the wealth of terminology used in this area of investigation, particularly with respect to the category of aspect. In general, the authors of the papers presented in this volume assume a distinction between grammatical aspect and lexical aspect. However, the latter concept, meaning the semantic contribution of the verb or verb phrase, may also be referred to by different authors as *verbal aspect*, *eventualities*, *lexical semantics of the verb*, or *actionality*.

PART I.

WHAT IS TIME AND TAME IN LANGUAGE?

CHAPTER ONE

TIME AND LANGUAGE

EMMON BACH[*]

What, then, is time?
If no one ask of me, I know;
if I wish to explain to him who asks,
I know not.
(St Augustine, **Confessions** XV:17).

Introduction

Time is at the very heart of language. This is evident not only in the signals that we use to transmit messages but also in the meanings that these signals convey. Phonology is all about timings, sometimes very precise timings. It is instructive to speculate about the analogues of meaning distinctions that we find in phonology. Truly, ontology recapitulates phonology!

Tense logic, linguistic semantics, physics, philosophy are all disciplines that have concerned themselves with the nature of Time. We will look at some of the major ideas about the nature and structure of time and consider whether natural language or natural languages shed any light on some of the perennial questions about Time: is Time immanent in the nature of the world, is Time independent of What Happens in Time, is Time infinite, discrete, dense? We will see that a good suitably flexible linguistic account of time does not pin speakers of natural languages down on such questions, but rather provides a matrix within such questions can be discussed[1].

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1. Questions about Time

Here are some of the major questions about the nature of time. In Section 3 we take up some of these questions again in the context of linguistic semantics.

1.1 The Big Issue

Yet I say with confidence that I know that if nothing passed away, there would be no past time; and if nothing were still coming, there would be no future time; and if there were nothing at all, there would be no present time. (St Augustine, ibid.: continuing from first quote above.)

Is Time independent of things and happenings?

Plato, Newton, et al.: Yes.
Aristotle, St Augustine, Leibniz, et al.: No.

Let me quote a contemporary philosopher, Ned Markosian:

The question of whether there could be time without change has traditionally been thought to be closely tied to the question of whether time exists independently of the events that occur in time. For, the thinking goes, if there could be a period of time without change, then it follows that time could exist without any events to fill it; but if, on the other hand, there could not be a period of time without change, then it must be that time exists only if there are some events to fill it.

Aristotle and others (including, especially, Leibniz) have argued that time does not exist independently of the events that occur in time. This view is typically called either "Reductionism with Respect to Time" or "Relationism with Respect to Time," since according to this view, all talk that appears to be about time can somehow be reduced to talk about temporal relations among things and events. The opposing view, normally referred to either as "Platonism with Respect to Time" or as "Substantivalism with Respect to Time" or as "Absolutism with Respect to Time," has been defended by Plato, Newton, and others. On this view, time is like an empty container into which things and events may be placed; but it is a container that exists independently of what (if anything) is placed in it. (Stanford Encyclopedia of Philosophy: s.v. Time = Markosian 2010).

I will refer to these two views here as *Relationist* and *Absolutist*.

Something like this distinction was invoked by the American linguist Benjamin Lee Whorf (1956), who claimed that the Hopi world-view was

much more congenial to a basically Einsteinian relativistic idea of time than the rigidly Newtonian conception of what he (elsewhere) called Standard Average European.

(The Hopi language belongs to the Uto-Aztecan family.) More on this below (Section 2).

1.2 Times without Time?

> But I say that Thou, our God, art the Creator of every creature; and if by the term "heaven and earth" every creature is understood, I boldly say, "That before God made heaven and earth, He made not anything. For if He did, what did He make unless the creature?" And would that I knew whatever I desire to know to my advantage, as I know that no creature was made before any creature was made. (St Augustine, *Confessions*. Chapter XII, p. 14)

a. Before Time was, how long did it last?
b. Before anything happened, how long did it last?

The principal difference between the Relational and Absolutist views concerns the question raised by Augustine. Can there be a time when nothing happens?

Excursus: Shoemaker's World

A much discussed example by Sydney Shoemaker (1969) purports to show that it is possible to conceive of a world in which we can say that time passes even though nothing happens. Shoemaker imagined a possible world which is divided into three parts: A, B, and C. The three experience complete "local time freezes" of exactly one year on a regular basis but on different schedules: in A every third year, in B every fourth year, and in C every fifth year. Consequently, every sixtieth year there is a complete freeze in which nothing happens in the entire possible world. Shoemaker argues that this possible world is logically and conceptually possible, even though to the best of our knowledge it is physically impossible.

1.3 Measuring time

a. Time is measured by things happening / rehappening.
b. Motions of the planets, revolutions of the earth, movements of a chronometer, period of the cesium atom.

A "cesium(-beam) atomic clock" (or "cesium-beam frequency standard") is a device that uses as a reference the exact frequency of the microwave spectral line emitted by atoms of the metallic element cesium, in particular its isotope of atomic weight 133 ("Cs-133"). The integral of frequency is time, so this frequency, 9,192,631,770 hertz (Hz = cycles/second), provides the fundamental unit of time, which may thus be measured by cesium clocks.

Today, cesium clocks measure frequency with an accuracy of from 2 to 3 parts in 10 to the 14th, i.e. 0.00000000000002 Hz; this corresponds to a time measurement accuracy of 2 nanoseconds per day or one second in 1,400,000 years. It is the most accurate realization of a unit that mankind has yet achieved. A cesium clock operates by exposing cesium atoms to microwaves until they vibrate at one of their resonant frequencies and then counting the corresponding cycles as a measure of time. The frequency involved is that of the energy absorbed from the incident photons when they excite the outermost electron in a cesium atom to jump ("transition") from a lower to a higher orbit.[2]

(v) Is the set of times infinite or finite?

...suppose the set of times is finite. Then, certain sentences will be logically false, and their negations logically true. Let N be the cardinality of the finite set *J*. Then any sentence of the form "p1 and then p2... and then $_{pN+1}$" will be true at no possible world and its negation true at all possible worlds.[3]

1.4 Discrete vs. Continuous or Dense

If time is discrete, then it makes sense to talk about the "next" moment. Otherwise not. If time is continuous or dense then between any two moments there are always intervening moments. If the ordering of the elements is total (connected), then for any two times one is earlier than or equal to the other.

1.5 Linear or Circular?

This is like deja vu all over again. (Yogi Berra)

die ewige Wiederkehr Nietzsche and modern cosmology

(1) Whatever is happening now has happened before and will happen again.

Philosophers, scientists, and whole cultures and religions have entertained or argued for circularity of time (compare Dowden 2011).

(2) The first time -- this time around! -- I looked into your eyes...

1.6 What is Now?

Several questions about now. The meaning of *now*?

a.   What is the time of evaluation for the present tense? A point? A
     period or interval?
b.   "Now" in different possible worlds?

2. Praeludium: Natural Language Metaphysics

What preceded (Section 1) was a selection of problems -- physical or
metaphysical -- about the nature of Time. We turn now to questions about
whether Natural Language or natural languages embody or require any
specific assumptions about these or other problems. First, some general
remarks: What do we talk as if there is? And we are assuming that it is
possible to entertain such questions at the very basic level of the model
structures that we use in interpreting natural language(s). Our methods are
indirect. If we ask speakers of a language whether they believe that time is
discrete or continuous, for example, we might get -- if not just an
incomprehending stare -- a variety of opinions. But sometimes we can
look at consequences of one or another assumption for concrete judgments
about semantic entailments or the like and then take them as evidence for
or against the more general assumption.

Is it legitimate to make this distinction between natural language
metaphysics and "real metaphysics"? Whorf's remarks on SAE and Hopi
metaphysics make the claim that languages embody metaphysical
assumptions. Peter Ludlow (1999: 65) takes issue with this distinction.
Nicholas Asher (1993) embraces it and identifies the step from one to the
other with the step from Kamp's discourse representations to the
embedding into a model. Further to this: we are assuming it is possible to
distinguish between metaphysics of a language proper and cultural
assumptions. Whorf might very well have denied the possibility of such a
distinction. But the fact that thinkers speaking one and the same language
hold differing opinions on such matters seems to show that the distinction
is justified. The question then becomes, does the very language we speak
commit us to any metaphysical assumptions. I claim that it does and that
we can find out about these assumptions by looking closely at the
semantics of our language(s).

Basic framework:

Let's take as a starting point the model structure that is assumed in Montague's best known paper on natural language semantics (1973), henceforth referred to as PTQ.

Model Structure of Montague's PTQ: M1:

- i.   BOOL = <1,0> (True, False) (∅)
- ii.   I: set of possible worlds
- iii.   J: set of moments of time, ordered by ≤ (a simple ordering)*

*that is: antisymmetric, transitive, and connected or total.

- iv.   A: set of individuals
- v.   FUN: set of all functions built from the above

Some comments:

- vi.   BOOL is the set of truth values

We will see fit to add a third truth value: Undefined (see below)

- vii.   ad I: a possible world is simply a way things could be, introduced to help account for modalities
- viii. ad J: total ordering means that any two times are connected, and they are independent of worlds

See discussion below.

- ix.   ad A: there are no constraints on what can count as an individual and all individuals are on a par
- x.   functions from world-time pairs play a special role as explications of the notion of intensional as opposed to extensional meanings

For Montague a property is such a concept: the intensional meaning associated with *horse* for example will pick out the horses in any possible world that has horses. Similarly, the individual concept of Richard Montague picks out that individual in every possible world in which he

exists (under the Kripkean conception of names as rigid designators, which Montague follows).

The importance of the fact that times are independent of worlds can be seen in examples like this one (Bach 1981, 1986):

(3) If Mary had left on the space-flight this morning, she would now be eating breakfast.

This sentence invokes two possible worlds or courses-of-events: in one – the actual world – Mary did not leave on her space flight; in the other, she did leave. And it presupposes that we can identify times in these two possible worlds.

Two innovations or extensions:

The model structure M1 lumps all individuals into a single set A. PTQ includes these items in its various sets of basic expressions:

Terms: *John, Mary, Bill, ninety he0,he1,he3,...*
Common Nouns: *man, woman, park, fish, pen, unicorn, price, temperature*
Intransitive Verbs: *run, walk, talk, rise, change*
Transitive Verbs: *find, lose, eat, love, date, be, seek, conceive*

Without further stipulations, PTQ generates sentences like these:

(4) The temperature has dated a fish.
(5) A park loses every price.
(6) Ninety walks.
(7) The pen seeks Mary.

Consideration of examples led to the use of sorted domains: Link 1983: plural individuals, mass entities, Carlson 1977 (compare also Cresswell 1973) kinds, individuals, stages (manifestations), types of eventualities (see below, Section 3).

Truth values to include "Undefined" for sortal mismatches:

(8) Caesar is prime.

in the sense of "prime number"

(9)   Caesar is not prime.

(10) The storm lasted three hour.
(11) Jason lasted three hours.
(12) ?Jason took place in 1917.

If we say that (8) is simply false, then its negation (9) should be true. Our intuitions about (8) and (9) are that they suffer from the same problem. Caesar is just not the sort of thing to which the predicate *prime* can be applied. Similarly *last three hours* is properly applicable to things like storms, that is, events. For (11) we interpret *Jason* as the name of a storm, say, or coerce a reading in which we supply something like an endurance contest for Jason to take part in. (12) is even harder to interpret literally, again unless Jason is the name of a hurricane or the like. (Parallel: Selectional restrictions in Katzian semantic theory.)

3. Time in Language

3.1 The Big Issue

Recall the two views of time that Markosian delineated. The Absolutist view is basically a Newtonian view: Time (and Space) are absolute and unchanging, things exist and happen "in" these containers. On the other Relational view, time has no existence except as embodied in things, events, and their relationships.

In previous papers (Bach 1981, 1986; Bach Chao 2011), we have argued for a relatively weak set of assumptions about temporal relations. Take as basic relations of precedence and overlap among *eventualities* (events, processes, states) and think about *histories* instead of worlds and times, that is, basically a relational view of time. Drop the total ordering of PTQ's time scheme, that is, it is not necessary that every pair of eventualities are connected by the precedence and overlap relations. A set of eventualities that are so connected is called a *local history*. If all eventualities in a history are so connected, then we have a Newtonian history.

If this is right, then there is actually an asymmetrical relationship between the Absolutist and Relational views of time, since on this view a Newtonian history is (almost) just a special case of the general view of histories. If time is just constructed from the basic relations among things and happenings then there can be no time without happenings. "Almost," because in the Newtonian view, there can be periods of time when "nothing happens." This requires an additional assumption. More on this in a minute.

Something like our view of time as immanent to histories was proposed by Norbert Wiener (1914), and taken up by Russell, Whitehead, and more recently Hans Kamp (1980) and Timothy Fernando (2009).

The reduction of time to relations among events is part of a larger picture which takes events and other "eventualities" (processes, states) as full-fledged members of the set of individuals, going back to Davidson (1967) and developed as part of a semantics for English most fully in Parsons (1990) (see next section).

3.2 Eventology

"Eventology"[4]: the classification of eventualities and/or expressions about them due to Aristotle, Kenny, Vendler, Verkuyl, Dowty, and others. A major part of the discussion centered around the possibility and interpretation of (English) sentences using the progressive aspect (BE + V-ing):

(13) John is in London.
(14) ?John is being in London.
(15) Mary lives in London.
(16) Mary is living in London.
(17) Sally knows the answer.
(18) ?Sally is knowing the answer.

The previous sentences (13 - 18) all involve states. Stative sentences occur comfortably with the simple present tense. Progressives of statives are problematic (14), (18), or require special interpretations: for example, (16) forces a temporary interpretation for the predication. The remainder of these examples involves non-statives: processes or events. But note that the progressive itself is stative (Vlach 1993).

(19) Harry is mowing the lawn.
(20) Harry mows the lawn.
(21) Ed was mowing the lawn.
(22) Rose was running.
(23) Rose ran.
(24) Rose was running to the store.
(25) Jamison crossed the street.
(26) Jamison was crossing the street.
(27) Jamison was crossing the street, when the truck hit him.

Sentences like these and many others have been used to establish classifications of eventualities into (at least) three types: *states*, *processes*, *accomplishments* (originally also *achievements*). Much discussion, starting with Dowty (1977), centered on sentences like (25) - (27), illustrating the "imperfective paradox" or puzzle: while sentence (22) seems to entail the truth of (23), (26) can be true without (25) being true, as shown by (27).

There is a connection between eventology and the big issue of the nature of time. We can ask about the relation between the types of eventualities and possible worlds: a world with only states would be precisely a world in which nothing happens.

3.3 Measuring time: Time Adverbials

The linguistic expressions that have to do directly with time and temporal relations are tenses, and various kinds of adverbials and adverbial clauses, as well as expressions that refer directly to time. A persistent question is whether all languages "have" tenses as part of their grammar. We will finesse this question here and restrict our attention to several types of adverbials:

3.3.1 Point-Time Adverbials

(28) John left at 3 o'clock.
(29) In the beginning of the 19th century, historical linguistics was
       coming into its own.
(30) When Sally arrived, Sam left.
(31) When Larry was in New York, he got a job as a reporter.
(32) ?When Sam was lying in bed, he got up.

Examples like (30) and (31) provide semantic motivation for the difference between states and non-states. For (30) to be true, Sam's leaving is at or shortly after Sally's arriving. In (31) the period of Larry's being in New York must overlap the time of his getting a job as a reporter. The anomaly of (32) is to be explained by the same constraint.

3.3.2 Durational Adverbials

(33) Sharon ran for three hours.
(34) For three years, I lived in Sicily.
(35) While Erin did the dishes, Ethyl watched TV.

3.3.3 Discrete vs. Continuous

Natural language seems to provide the means to talk as if it made sense to talk about the next moment: ***and then***, ***right after***, and the like. And there are locutions where it seems to be analytic that something is true immediately after something else:

(36) As soon as he got up, he was up.

Nevertheless, we usually talk in a looser manner, as is often pointed out in a court of law:

(37) Was that really the very next thing you did?

We can see the seeds of these two ideas of time in the pervasive distinction between count and mass domains (Link 1983). Parallels to the mass-count distinction in the realm of eventology have been drawn (Bach 1986b and literature cited there). Events are countable, processes are not, just as horses are countable and mud is not.

3.3.4 Linear or Circular

Could time be circular, as far as natural language is concerned? Of course. There may be many reasons to reject the notion of circular time for philosophical or physical -- or even theological -- reasons, but none of them are linguistic, in my opinion. Note that on the view of time that we are endorsing here, words like ***before*** and ***after*** are normally interpreted as being relevant to local histories. Otherwise, it would be perfectly normal to entertain the truth of both of the following sentences:

(38) Sally left the party before Harry did.
(39) Harry left the party before Sally did.

This takes a bit of a mind-stretch: (38) might be true on this cycle, but on an earlier cycle Harry left and that was "before" this cycle.

3.3.5 What is Now?

What is the time of evaluation: an instant? A period or interval?

(40) I dub thee Lancelot.
(41) I am dubbing thee Lancelot.
(42) He dubs him Lancelot.
(43) He is dubbing him Lancelot.

(40) is a performative sentence. By uttering it I actually carry out the dubbing action, which is then simultaneous to the action. This performative force is lost with the progressive (41) or if the subject is not the utterer/performer of the action (42). Hence the interpretation of the eventive sentence is perfectly normal for the other cases. These examples are perhaps related to the "sportscaster" interpretation of non-stative sentences in examples like these:

(44) Smith runs to third base.
(45) Jones misses the throw from center-field.
(46) Smith scores!

Here the sportscaster is making a picture of the action on the baseball diamond. Hence, by fiat, his sentences are simultaneous with the depicted events.

Final Thoughts

I hope to have shown that English and perhaps other languages are more like Whorf's Hopi than his English or other Standard Average European languages. As to the differences between the Relational and Absolutist views, I have argued that there is an asymmetry. The Absolutist view requires additional assumptions. Moreover, it makes a lot of sense to me to say that natural languages are pretty flexible in their time-talk. Otherwise how could we talk to each other about all these various choices.

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Notes

[1] In this chapter, I will draw freely on these earlier works: Bach 1981, 1986; Bach and Chao 2011.

[2] http://tycho.usno.navy.mil/cesium.html

[3] From Bach 1981.

[4] Cf. Bach Chao 2011.

TENSE-ASPECT-MOOD-EVIDENTIALITY (TAME) AND THE ORGANIZATION OF HUMAN MEMORY

ÖSTEN DAHL[*]

Introduction

In a wide sense of the word *remember*, I remember both that beavers build dams and that I will give a lecture tomorrow. But in a stricter sense, I can only remember what happened in the past, for instance, that I gave a lecture yesterday. All these things are in my memory, but clearly, they differ in their status there. That human memory is in many ways dependent on time is hardly a controversial statement, but it entails that there is at least an indirect relationship between memory and those linguistic phenomena that relate to time, such as the distinction between *I will give a lecture* and *I gave a lecture*.

In this paper, I will discuss whether there is also a more direct relationship between the organization of human memory and the cluster of grammatical elements usually subsumed under labels such as tense, aspect, mood, and evidentiality. This is an area which has hardly been explored at all, at the same time as memory research is a rapidly developing field with many competing theories. It is not my intention to argue for any definite hypotheses but only to point to possible connections that deserve to be further explored.

The structure of the paper is as follows. First, I shall give a brief sketch of the linguistic phenomena involved, then, a somewhat more detailed outline of the aspects of the organization of human memory that I find potentially relevant. Two features of particular interest are the distinction between episodic and semantic memory and the notion of consolidation of

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