Time and Language:

How we talk about time

Peter Watson

IT'S ABOUT TIME

Time is an Illusion: lunch-time doubly so

Hitchhiker's Guide

1

A digression before we start: how do we describe what goes on?
The Sapir Whorf hypothesis.

(Very loosely).

- The **strong** form: you cannot discuss a concept unless you have the language to describe it.
The *weak* form: your views of the universe are modified and restricted by language.

2

A famous wrong example: Inuit have 56 words for snow
(they actually have one!).
However skiers have at least 10:
(powder, crud, hard-pack, ice, crusty, slush, spring, corn, sugar, fresh, wet, piste, corduroy....).
Most of these distinctions are meaningless to non-skiers, but they allow a concepts to be transferred in compact form.

3

So does it work?

- Better: language represents a "window into the mind" (Pinker)

- We think in "mentalese" and translate it into a language

4

- I picked the car up yesterday, so that, if you go to the supermarket now, I will have time to drive to Montreal.

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- Ich habe das Auto gestern auf, damit, wenn Sie zum Supermarkt jetzt gehen können, ich Zeit habe, nach Montreal zu Fahren.
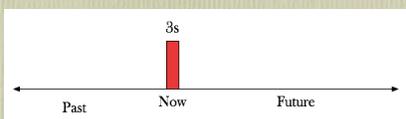

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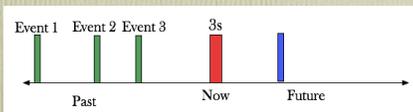
- Ich habe das Auto gestern auf, damit, wenn Sie zum Supermarkt jetzt gehen können, ich Zeit habe, nach Montreal zu Fahren.

- Ayer recogí el coche, asi que, si puedes ir al supermercado ahora, tendré suficiente tiempo para conducir a Montreal

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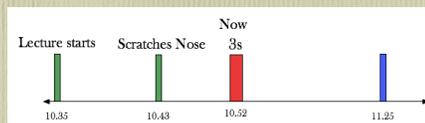An (unspoken) model of time: Note 3 s "now" is confirmed by psychology

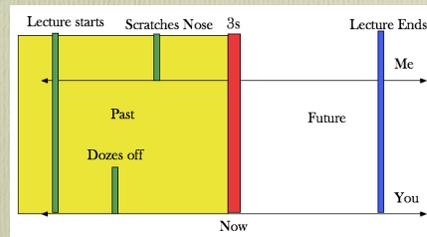- However we tie down past and future with events.

- We'll call this the linear model

Our linear model of time is enhanced in several ways: Absolute time (rather than relative)

- Multiple Frames of reference. Note we agree on common events, past and future

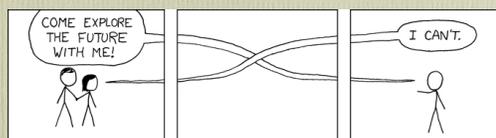- Past is immutable, future is fluid

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Not just in philosophy and physics, but poetry as well

- The Moving Finger writes; and, having writ,
  Moves on: nor all thy Piety nor Wit
  Shall lure it back to cancel half a Line,
  Nor all thy Tears wash out a Word of it.
  Rubaiyat of Omar Khayyam tr. by Edward FitzGerald

- Time past and time future
  Allow but a little consciousness.
  To be conscious is not to be in time
- T. S. Eliot Burnt Norton

- And the seasons they go round and round
  And the painted ponies go up and down
  We are captive on the carousel of time
  We can't return we can only look behind from where we came
  And go round and round and round in the circle game
  Joni Mitchell The Circle Game

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or XKCD

E.g. We can construct "impossible" sentences

- I might stop for a coffee on the way to Montreal

- I might stop for a coffee on my way to the garage yesterday

E.g. We can construct "impossible" sentences

- I accidentally ran over an old lady on the way to the garage

- I will accidentally run over an old lady on the way to Montreal

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Time in English

- We have a vast array of words linked to time: e.g.

Measurement of time: hour, minute, second, year, epoch, age, period, watch (two meanings) , clock,.....

Passage of time: brief, momentary, lengthy, overlong,

Temporal ordering, or relative time: before, after, future, past, history, late, early, first, second, causal, prediction .....

Absolute time (usually in phrase) : 9/11, last Tuesday, Death of Caesar ....

Time in English

Change: rapid, slow, languorous, flow, dragging,......

Many more that imply time: paleolithic, oscillatory, periodic, ancestor, descendant, son, speed, acceleration, breakfast, teatime,

Note (very important for later) we already have the idea that things change with time ; e.g.

$$speed = \frac{distance}{time} = \frac{d}{t}$$

The past, present and future walked into a bar.

The situation was tense

Tenses

but not just words: grammar. In Latin we learned 6 tenses:

Present	Amo, Amas, amat	I love, you (s) love, he she or it loves
Past	amavi	I loved
Future	amabo	I will love
Imperfect	amabam	I used to love/I was loving
Pluperfect	amaveram	I had loved
Future perfect	amavero	I will have loved

- Note that this is grossly simplified: these are Indicative active tenses
- We also have Subjunctive active (amem ⇔ May I love)
- Indicative passive (amor ⇔ I am loved)
- Subjunctive passive (amer ⇔ May I be loved)
- Imperative (ama ⇔ Love! (or else))
- These are "moods", but we are really only interested in the temporal aspects

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Tenses

In Latin we learned 6 tenses: claim in English that we have 10:

Present Simple	I speak	Implies ability to do something in the present
Present continuous	I am speaking	
Present perfect	I have spoken	No particular time implied
Imperfect	I used to speak	I used to love/I was loving
Pluperfect	I had spoken	Implies temporal ordering ("I had spoken before leaving")
Preterite/Aorist	I spoke	
Conditional	I would speak	Can refer to past as well as the future (!)
Past Continuous	I was speaking	
Future	I will speak	Can imply prediction or intention
Future perfect	I will have spoken	Implies series of action in future

- Stolen and adapted from Wikipedia

Note many subtleties: e.g prediction
We will overcome (Negro Spiritual)
vs volition
We shall overcome (Peter Seeger's adaptation)

Note that although we always use the same English construction for prediction, we don't mean the same thing: e.g.
The sun will rise tomorrow
The Sens will win the Stanley Cup

Also note that not all of these translate into even other Indo-European languages e.g

"I speak" & "I am speaking" ⇒ "je parle"

"I speak" & "I am speaking" ⇒ "Ich spreche"

but "I speak" ⇒ "Sto parlando" & "I am speaking" ⇒ "Parlo"

This does not imply that those languages are incomplete

Also note that other languages have other tenses (again from Wikipedia)

- **Near future tense:** in the near future, soon
- **Hodiernal future tense:** sometime today
- **Post-hodiernal future tense:** sometime after today
- **Remote future tense:** in the more distant future
- **Predictive future tense:** a future tense which expresses a prediction rather than an intention, i.e., "I predict he will lose the election, although I want him to win". As such, it is really more of a mood than a tense. **(Its tenseness rather than modality lies in the fact that you can predict the future, but not the past.)**
- **Nonfuture tense:** refers to either the present or the past, but does not clearly specify which. Contrasts with future.
- **Nonpast tense**: refers to either the present or the future, but does not clearly specify which. Contrasts with past.
- **Not-yet tense:** has not happened in present or past (nonfuture), but often with the implication that it is expected to happen in the future. (As such, is both a tense and a modality). In English, it is expressed with "not yet", hence its name.

Causality: a meta-rule in science

- i.e. all effects have a cause, which precedes it in time.

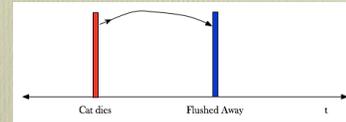- *Wind is caused by trees waving their branches (Ogden Nash, see also G. K. Chesterton)*

Note this is not a matter of science (!): could a religion deal with an acausal universe?

Can we even contemplate a universe where a large number of events occur without cause?

Causality and Language

- Handled by standard constructions

- *The cat died so I flushed it down the toilet*

- *Because the cat was dead, I flushed it down the toilet*

- Note implied sequence of events

Cat dies   Flushed Away   t

- But note we have constructions that violate causality

- *I went to the supermarket yesterday because I have to go to the dentist tomorrow*

- Will need a more precise way to define causality

Free-will/Determinism

- in the Sapir-Whorf context, English is biased in favour of free-will: e.g.

- "I decided to go to the movie tomorrow"

- "I decided not to go to the movie tomorrow"

- Both sound sensible, but

- "It is predetermined that I will go to the movie tomorrow" sounds stupid

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Are there any temporal concepts that we **cannot** express in English?

Note that we can easily understand temporal concepts we have never discussed before. E.g. Red Dwarf

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WARNING: NOTHING TO OUTPUT
BFRAME DECODER LAG
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Do we need all these tenses?

Damon Runyon:

- "More than Somewhat" (two stories make up the musical "Guys and Dolls")

- "Furthermore"

- "Take It Easy"

- collected in "Runyon on Broadway"

Dancing Dan's Christmas

Now one time it comes on Christmas, and in fact it is the evening before Christmas, and I am in Good Time Charley Bernstein's little speakeasy in West Forty-seventh Street, wishing Charley a Merry Christmas and having a few hot Tom and Jerrys with him.

This hot Tom and Jerry is an old time drink that is once used by one and all in this country to celebrate Christmas with, and in fact it is once so popular that many people think Christmas is invented only to furnish an excuse for hot Tom and Jerry, although of course this is by no means true.

But anybody will tell you that there is nothing that brings out the true holiday spirit like hot Tom and Jerry, and I hear that since Tom and Jerry goes out of style in the United States, the holiday spirit is never quite the same.

The reason hot Tom and Jerry goes out of style is because it is necessary to use rum and one thing and another in making Tom and Jerry, and naturally when rum becomes illegal in this country Tom and Jerry is also against the law, because rum is something that is very hard to get around town these days.

For a while some people try making Tom and Jerry without putting rum in it, but somehow it never has the same old holiday spirit, so nearly everybody finally gives up in disgust, and this is not surprising, as making Tom and Jerry is by no means child's play. In fact, it takes quite an expert to make good Tom and Jerry, and in the days when it is not illegal a good hot Tom and Jerry maker commands good wages and many friends.

Does it translate?

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Noël de Dan Dansant

MAINTENANT une fois il vient sur Noël, et en fait c'est la soirée avant Noël, et je suis en temps utile Charley Bernstein's peu de bar clandestin dans la rue d'ouest Forty-seventh, souhaitant à Charley un Joyeux Noël et ayant quelque Tom et Jerry chauds avec lui.

Ce Tom chaud et Jerry est une boisson ancienne avec laquelle est une fois employé par une et toutes dans ce pays pour célébrer Noël, et en fait il est une fois si populaire que beaucoup de personnes pensent que Noël est inventé pour fournir seulement une excuse pour Tom et Jerry chaud, bien que naturellement ce soit nullement vrai.

Do we need all these tenses?

Damon Runyon:

- One use of past tense in 800 pages (in "The Lily of St Pierre")

Text

Non-European Languages

- Have found their own way to handle time

- e.g. Eastern Languages (thank you Cho & Marcus Watson)

- Japanese; no tenses, but concepts conveyed by adverbs

- "I speak futurely"

- "I speak pastly"

Text

Chinese works with "particle" words: no exact equivalence in English:

I eat.	我吃饭	
I am eating	我正在吃饭	---"正在" presents "ing"
I have eaten/I ate	我吃过饭了	---"过"and"了" presents past tense
I was eating	我正在吃饭了	
I had eaten	我吃过饭了	
I will eat	我将会吃饭	"将会" presents future tense
I will be eating	我将会正在吃饭	
I will have eaten	我将会吃过饭了	

昨天下午1点，我去看他时，他正好吃过午饭。
Yesterday afternoon at 1pm, when I went to visit him, he had eaten his lunch.
今天下午1点，我去看他时，他正好吃过午饭。
This afternoon at 1pm, when I went to visit him, he had eaten his lunch.
明天下午1点，我去看他时，他将正好吃过午饭。
Tomorrow afternoon at 1pm, when I go to visit him, he will have eaten his lunch.

Note that sentences are identical except for particles
No tenses in European sense

Text

- The simplest form of English is pidgin: e.g. in Northern Nigeria, just 3 tenses:

Present: I eat bread ≅ I am eating the bread

Future: I go eat bread ≅ I will eat the bread

Past: I done eat bread ≅ I ate the bread

Note this leads to oddities such as "I go come' and "I done come"!

Text

- Haitian Creole (kreyòl) shows something similar: no conjugation, but uses markers

Present: *m ap manje* – "I am eating"

Future: *mwen pral manje* – "I am going to eat"

Past: *mwen te manje* – "I ate" or "I had eaten"

Past Progressive: *mwen t ap manje* – "I was eating"

Note much of vocab. is same as French but languages are not mutually understandable!

manje = manger

mwen = moi

Text

Oral cultures tend to have relative time but not absolute time.

Whorf claimed that the Hopi have no word for "time" or "past, present or future", (apparently true)

and hence had no concept of time (certainly false, since they have a calendar and understand crop planting etc.

Text

The Pirahã:

- an extraordinary example: the Pirahã: language has

1.No words for colour

2.No words for number

3.No creation myths

4.No words for ancestors

Even taught the Portugese words for numbers, "not one of them had learned to count to 10 or even to add 1 and 1" New Scientist, March 18th 2006

Some concepts they use do not exist in English: e.g xibipiio ≅ "appear" and "disappear". (note in English a time sequence iis implied by the concepts)
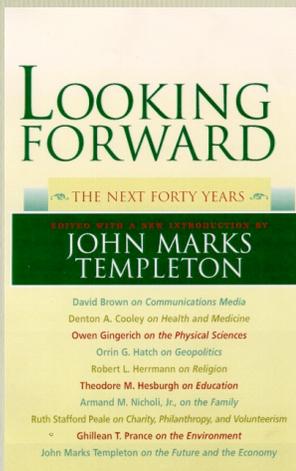
and apparently no concept of time in the Western sense

- Daniel Everett, "Don't Sleep, There are Snakes"

How do we visualize "line of time"

- In Western culture, future lies before us
- "back when I was a child"
- "I look forward to Xmas"

LOOKING FORWARD

THE NEXT FORTY YEARS

JOHN MARKS TEMPLETON

David Brown on Communications Media
Denton A. Cooley on Health and Medicine
Owen Gingerich on the Physical Sciences
Orrin G. Hatch on Geopolitics
Robert L. Herrmann on Religion
Theodore M. Hesburgh on Education
Armand M. Nicholi, Jr., on the Family
Ruth Stafford Peale on Charity, Philanthropy, and Volunteerism
Ghillean T. Prance on the Environment
John Marks Templeton on the Future and the Economy

Is it universal?

- Aymara (Peru) see past in front (where it can be seen) and future behind.

- Pormpuraaw (Australia) see past in the east, future in the west

- Yupno (Papua New Guinea) see future as uphill, past as downhill, associated with a winding river that flows through their village

Text

Final thoughts on Time and Language

- More advanced the language, more sophisticated the description of time.

Can we argue that language developed to explain our relationship with time?

Are there time-related concepts that we **cannot** describe in English?

the bad news: **Yes:** will show examples later on

Why are all languages obsessed with time but not space?

- E.g, "I walked across the room"
- "I (will walk) across the room"
- "I (am walking) across the room"
- But not
- "I (walked leftwards) across the room"
- "I (easterly walked) across the room

Final thoughts on Time and Language

In physics, we need to describe concepts which *don't* map well on to the English language, and don't necessarily have translations. e.g. "mass" and "weight" are almost synonymous in English and many languages have the same word. They also carry cultural baggage.

Further, we have concepts which have no correct mapping e.g. "electron".

Final thoughts on Time and Language

Maths represents a culture-free way of describing concepts.
No human investigation can be called real science if it cannot be demonstrated mathematically Leonardo da Vinci

And finally the **really** bad news

the linear model of time is WRONG

So how do we measure time