

Temporal Metaphors in Discourse

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Abstract

In this paper we present the results of a preliminary survey to investigate the range of temporal metaphors in mundane discourse in English. We concentrate in particular on temporal metaphors that involve space and movement, which we call 'spatio-kinetic' temporal metaphors. We present a sample of real text showing how, even in a short piece of discourse, a wide variety of temporal metaphors is used. The spatio-kinetic temporal metaphors discovered in our survey include, but, importantly, are not limited to, the temporal metaphors identified by Lakoff and Johnson (1999) and Lakoff's Master Metaphor List (MML). We propose a number of new categories of temporal metaphor that should be added, and present a preliminary re-grouping of the list. We then consider the various ways in which temporal metaphors can be "mixed" or combined in discourse, and present examples of such combinations. Finally, we argue that, in order to determine the temporal relations between the events, states, etc. described in text, not only do we need to consider the interaction between tense, aspect, temporal adverbials and so on, but that we need to understand the crucial contribution made by temporal metaphors to the temporal structure of discourse.

Resumo

Este artigo apresenta resultados de uma amostragem preliminar para a investigação de metáforas temporais em discurso mundano em inglês. Nos concentramos, em particular, em metáforas temporais que envolvem espaço e movimento, denominadas "espaço-cinéticas". Uma amostra de textos reais é apresentada, demonstrando como, mesmo em curtos trechos de discurso, uma ampla variedade de metáforas temporais é utilizada. As metáforas temporais espaço-cinéticas descobertas nesta pesquisa incluem as metáforas temporais de Lakoff e Johnson (1999) e a Master Metaphor List (MML) de Lakoff, mas, o que é importante, não se limitam a elas. O acréscimo de várias categorias novas é proposto, e um reagrupamento da lista é apresentado. A seguir, as várias maneiras em que metáforas temporais podem ser combinadas em discurso são consideradas, e exemplos de tais combinações são apresentados. Finalmente, argumentamos que, de modo a determinar as relações entre eventos, estados, etc. descritos em texto, é preciso não somente considerar a interação entre tempos e modos verbais, advérbios temporais e assim por diante, mas também entender as contribuições das metáforas temporais na estrutura temporal do discurso.

* This paper is based on a presentation given at the Conference on Metaphor and Thought, Pontifical Catholic University of São Paulo, Brazil, 21-25 October 2002. We would like to thank the conference participants for their helpful comments, criticisms and suggestions. We would also like to thank Aaron Sloman, who alerted us to the Strawson reference. The research was supported by EPSRC grant GR/M64208.

Key Words

Conceptual metaphor, temporal metaphor, mixed metaphor, discourse structure.

Palavras-chave

Metáfora conceitual, metáfora temporais, metáforas combinadas, estrutura do discurso.

1. Introduction

It is very difficult, if not impossible, to speak about time without using some kind of temporal metaphor or model. These metaphors may pass by unnoticed in ordinary speech, where we frequently use expressions such as ‘Christmas is approaching’, ‘My deadlines are catching up with me’ and ‘I’m running out of time’, without consciously reflecting on the underlying concepts of space, motion and substance (for example) on which these temporal models are based. Lakoff and Johnson (1980, 1999) claim that much of our understanding of time is founded on a deeper, more fundamental experience of space and movement, available to us by virtue of having bodies that we can move around in space (Lakoff and Johnson 1999, chapter 10). The evidence for this comes, in part, from cross-linguistic observations which show that the same underlying models are expressed, with only relatively minor variations, across a wide range of languages. Lakoff and Johnson identify a set of seven such “conceptual metaphors” for time, four of which are based on space and movement, while the remaining three involve other concepts such as resources and personification. The following seven temporal metaphors are listed in Lakoff’s Master Metaphor List (MML) (<http://cogsci.berkeley.edu/targets/Time.html>).¹

- Time is a container (bounded)
- Time is a landscape we move through
- Time is something moving towards you
- Time is a pursuer

- Time is a changer
- Time is a resource
- Time is money

In this paper we will concentrate mainly on the first four of these, which are all based on notions of space and movement. We will refer to these as ‘spatio-kinetic’ temporal metaphors or models. Some of these (perhaps the first) may be based purely on space, with no notion of movement, so the term should be taken to mean “movement and/or space”.

¹ In other work by these authors, e.g. (Lakoff and Johnson 1999), the set of temporal metaphors is organised slightly differently. For clarity, I will refer only to the MML version, as accessed at the above URL on 10/11/2002.

Lakoff and Johnson make a very strong claim (Lakoff and Johnson 1999:139) that “*Most of our understanding of time is a metaphorical version of our understanding of motion in space*” (my italics). We have some reservations about this. While not questioning that an important part of our understanding of time appears to be based on spatio-kinetic notions, we think that Lakoff and Johnson are overlooking at least one very important alternative model for time – one which is based on such notions as change, cause, effect and the irreversibility of events.

Lakoff and Johnson concede that these notions form part of our understanding of time, but they claim that the contribution is to that part of our understanding that is “basic” and “literal” (Lakoff and Johnson 1999: 138). This seems unlikely, given that our concept of causation is itself, according to Lakoff and Johnson, in part metaphorical. It seems much more plausible to argue that we have (at least) two broad metaphorical models for time – one involving a view of time in spatio-kinetic terms and one that sees time in terms of cause, directionality and change. It may even be that these two models, while each working quite well on their own, and capable of being combined in a number of ways, are in some way fundamentally incompatible. Perhaps some of the philosophical confusion generated by considerations such as “travelling in time” stem from this incompatibility. This is somewhat speculative, but our main point is that, while Lakoff and Johnson have shown that the spatio-kinetic model is an important part of the way we understand time, they have not shown that it is the only way, or even the most important one. We believe that they may have overlooked an equally important type of metaphor for time – one that is also grounded in our embodied experience of the world but which views time in terms of cause, effect and change.

We would argue that, at the very least, much more work is needed before we can claim to understand the various ways in which we conceptualise time, and the extent to which each of these models contributes towards our understanding.² Lakoff and Johnson have identified, from a linguistic standpoint, some important temporal metaphors, but much remains to be done. A modest start will be made in this paper by reporting the results of some preliminary investigations into the range of temporal metaphors to be found in mundane discourse in English, and some ways in which they may be combined.

We will present the results of a preliminary survey which shows that there are a number of additional commonly used temporal metaphors which do not fit neatly into Lakoff and Johnson’s seven categories. This will lead us to propose extending and reclassifying the temporal metaphors in the MML. We will also present the results of a second preliminary survey which examines the “mixing” of different temporal metaphors, often within the same clause. We will suggest that further work is needed to determine which temporal metaphors can be combined felicitously in the same clause, neighbouring clauses, etc., and which cannot. The results may well help us to achieve a usefully structured classification of temporal metaphors.

Finally, we will raise the question of how information obtained by the processing of temporal metaphors might be integrated with other temporal information obtained from the discourse, such as that derived from tense, aspect, temporal adverbials, and so on.

² It would also be very interesting to consider alternative ways that time might be conceptualised – for example, by a creature or artefact that had no perception or concept of space or movement, but was able to perceive changes in its environment – e.g. by being sensitive to sounds of varying pitch, intensity, duration, etc. A detailed argument in support of the coherence of the notion of such a being is given in (Mandik 1998), based on the auditory world thought experiment introduced in (Strawson 1959).

Our interest in temporal metaphor arose initially from the ATT-Meta project (Barnden & Lee 1999), one of the aims of which is to develop a computational account of reasoning with the content of metaphorical utterances. Not only are time metaphors important in themselves, but time is important in most commonsense domains and we need to be able to reason about it in our implemented system. Our computational perspective has led us to identify a number of principles concerning metaphorical reasoning that allow us to investigate temporal metaphors in a way that usefully complements research in the Cognitive Linguistics tradition. See, for example, (Wallington et al, ms).

It should be stressed that much of what follows takes the form of questions and suggestions for further work. We will not present much in the way of answers, but we hope that our questions will stimulate some much-needed detailed study of temporal metaphors and their classification, interaction and integration with the rest of discourse.

2. Temporal metaphors in text

One doesn't have to look very far to find temporal metaphors in written or spoken text. Below is a piece of text from a popular science book, which was chosen simply because one of us happened to be reading it at the time. A continuous short extract has been chosen, and the obvious examples of temporal metaphors highlighted in bold. The main point to note, if the reader needs convincing, is the frequency of such temporal metaphors in the text. The text consists of a narrative in the form of a diary, taken from a popular science textbook describing the finding of hominid fossils and the evolution of mankind. The author is describing his participation in a scientific expedition to Lake Turkana in Kenya to hunt for fossil remains and attempt to piece them together to form a skeleton. It is written in relatively mundane, non-specialist and non-literary style. At least five examples of temporal metaphor appear in the extract of less than 130 words.

“With **the end of the digging season fast approaching** (dictated as much by our money running out as by anything else), we were forced to assess how we should proceed. “Richard and I stared at the site plan **over lunch** and decided that if the rest of the skeleton is there, it is dispersed over a wide area,” recorded Alan, **on the evening of September 19, three days before we pulled out**. “Consequently, the whole of the hillside all round will have to be leveled.”

This was not **a pleasing prospect**. Although we would dearly have liked to get the missing pieces – some arm bones, a few teeth, but particularly the bones of the hands and feet – we knew that we might **spend a lot of time** and money and not find anything.”

(Excerpt from Leakey & Lewin 1992: 62-63.)

A quick survey of similar texts revealed that this piece of discourse is not unusual in its abundance of temporal metaphors. Note that while the text is reasonably complex, it is nevertheless lucid and clear. The temporal relations among the various events and states are conveyed precisely, without ambiguity.

The five metaphors highlighted in the text appear to correspond as follows to the temporal metaphors given in the MML:

With the end of the digging season fast approaching...

Time is something moving towards you

...over lunch...

Time is a landscape we move through

This was not a pleasing prospect.

Time is a landscape we move through

...on the evening of September 19th...

Time is a landscape we move through³

...we knew that we might spend a lot of time...

Time is money

It is interesting to see that the identified temporal metaphors often appear quite close together in the text – sometimes in the same sentence – yet no incoherence or confusion results.

It is important to note, too, that these models play an essential role in our understanding of the temporal relations within the text. We will return to this point later.

Several questions are raised immediately:

- Does the MML give a complete listing of all temporal metaphors in use?
- What constraints, if any, are there on “combining” or “mixing” the various temporal metaphors?
- How is switching between metaphors signalled, if at all?
- How do the temporal metaphors interact with other temporal information provided by the text, e.g. from temporal adverbials, tense, aspect, etc?

Few (if any) definitive answers will be offered in this paper. As stated above, our intention is mainly to draw attention to the need to address these issues, to present some preliminary findings, and to make some suggestions for further research.

3. Temporal metaphors in the Master Metaphor List (MML)

Since our main concern was with spatio-kinetic metaphors for time, we carried out a preliminary Web search using the Google© search engine, in order to look for examples from each of the first four categories (and, possibly, additional spatio-kinetic ones). It proved to be very easy to

³ Although ‘on the evening of ...’ may not strike the reader as metaphorical, in (Lakoff & Johnson 1999) expressions such as ‘at 10 o’clock’ are stated to be examples of “Time is a landscape” (p. 146), so we are assuming that they would classify temporal expressions involving the preposition ‘on’ in this way, too. The fact that this construction can be extended in novel ways, for example ‘Christmas landed on a Wednesday this year’ offers further support for treating such expressions as metaphorical.

find examples from all four of the spatio-kinetic categories in the MML, simply by keying appropriate phrases such as “is/are approaching”, “time is approaching”, “chased by deadlines”, “chasing deadlines”, etc., into the search engine. As this was very much a preliminary investigation, we made no real attempt to be systematic or comprehensive. Our main aim was to get an idea of what kind of temporal expressions were in use in “real” examples of relatively mundane discourse. We did not restrict our search to particular subject areas, but we excluded any examples found which were clearly from “specialist” domains and/or discourse types, such as formal scientific discourse (e.g. discussion of time in cosmology or quantum physics) or from highly literary contexts including poetry. Of course, we are not trying to claim any kind of representative adequacy for the examples produced. One would need to do a much more thorough and systematic corpus study in order to obtain results which could claim to be in any way representative of a particular domain, discourse type, speech community, culture, etc. We believe that our very brief investigation highlights the need for such studies, and that these will be needed if we are to achieve a deep understanding of our metaphorical concepts of time and the way that these are expressed in human languages.

A selection of our findings is given below. Where the category is one of those listed in the MML we have indicated this in brackets after the name of the category. The category labels A-K are our own.

Some of the examples fall into more than one category, or there could be dispute over exactly which category to use (e.g., it is sometimes difficult to say whether a container or a landscape is involved. It should be noted, incidentally, that the words ‘landscape’ and ‘container’ are used in a very general sense here, both by us, and, we suspect, by Lakoff). In these uncertain cases, we have simply included them under what struck us as the most “obvious” category.

A. Time is a bounded container (MML)

1. This page moved in 1998!
<http://www.chem.uky.edu/resources/msds.html> (accessed 20/11/02)
2. It ... looks like something out of the last century.
<http://www.prostatitis.org/allopurinol.html> (accessed 20/11/02)
3. ...part-way through the insurance period...
http://www.zurich.co.jp/direct/en/auto/q_a.jsp (accessed 20/11/02)

Note that (3) can also be seen as an example of category B.

B. Time is a landscape we move through (MML)

4. ...we are approaching Christmas...
<http://www.episcopalchurch.org/ens/98-2272.html> (accessed 20/11/02)
5. In the months leading up to that time...
<http://www.giramondo.org/inglese/voluntary/voluntary.htm> (accessed 20/11/02)

C. Time is something moving towards you (MML)

6. ...the time is approaching when you’ll be ready to join the ranks of homeownership.
<http://www.lifelines2000.org/services/articles/20020206/095231.asp?RootID=450>
(accessed 20/11/02)

7. ...the future is rushing to meet us.

<http://tigger.uic.edu/~rebecca/educrec.html> (accessed 20/11/02)

Lakoff and Johnson (1999) refer to B and C as being, strictly speaking, “inconsistent” with one another, and as “figure-ground reversals”. This seems to be rather a strange position to take, as there is no apparent reason why the observer and time cannot both be in motion, travelling towards each other. Given that what we actually experience is relative motion, and that it is impossible without prior knowledge to say which of the observer or the landscape is moving⁴, then it seems perfectly natural that there would be no incongruity between the two models. One very plausible interpretation of (7) is that both the observer and time (i.e. “the future”) are in motion, moving towards each other.

Lakoff and Johnson (1980), however, seem to view B and C as being complementary, which is more in line with our claim.

At any rate, we believe that it makes more sense to group B and C together in a single category, and we will adopt this strategy below.

There is, however, one well-known example where B and C appear to conflict, involving examples like ‘The meeting was moved forward [or ‘ahead’] by an hour’. This has two possible interpretations – one where the meeting is moved to an hour later, and one where it is moved to an hour earlier. This can be explained by assuming that the “hour later” reading is based on model B, where the observer is moving towards the meeting, which is viewed as a stationary event in a landscape. Moving the meeting forward by an hour means that the observer will not “reach” the meeting until an hour later. The “hour earlier” reading is based on model C, where the meeting is seen as moving towards the stationary observer. Moving the meeting forward by an hour therefore results in the meeting “reaching” the observer an hour earlier.

Although there is a genuine ambiguity here resulting from the two alternative models, I am not convinced that this justifies calling the two models contradictory. A better explanation is to see the ambiguity as residing in whether the words ‘forward’ and ‘ahead’ relate to the observer or to the event. This is not the same as saying that the two models are inconsistent or incompatible. Indeed I think there is good reason, given our experience of relative motion discussed above and the existence of examples like (7), to group them together.

Note, too, that it is possible to combine the two models in the same sentence – for example, it sounds perfectly natural to us to say ‘Christmas is rapidly approaching – we have already reached the end of November’ without any sense of contradiction.⁵

Further possible ways of combining the various models will be further discussed below.

D. Time is a pursuer (MML)

(i) Observer stationary (?)

8. Deadlines are creeping up on me...

http://www.violaonline.net/2001_03_01_blogarch (accessed 20/11/02)

⁴ We often use expressions like “The fields and trees rushed past us”, to describe our experience, for example, of sitting in a moving train.

⁵ Just as we may say, without any sense of contradiction, ‘The fields and trees rushed past us as the train sped towards Glasgow’.

9. The future is creeping up behind their backs.
<http://ramblewoodmiddle.com/s9901.pdf> (accessed 18/3/02)

(ii) Observer moving too

10. I am... chased by deadlines...
http://www.ex.org/4.7/05-feature_ amano2.html (accessed 20/11/02)
11. ...time is catching up with him...
<http://www.suntimes.co.za/2000/02/13/sport/sport03.htm> (accessed 20/11/02)

While category D is present in the MML, Lakoff does not divide it into two sub-categories as we have done. In D(i) the observer is stationary (or, at least, the movement of the observer is not an issue), whereas in D(ii) the observer is definitely in motion, moving in the same direction as time, with time behind him.

E. The observer is a pursuer

12. We are catching up with time to improve the site...
<http://members.tripod.com/asianonart/guestbook.html> (accessed 20/11/02)
13. ...design students frantically chasing deadlines...
http://www.berkshirepartners.com/2_2_5_business.shtml (accessed 20/11/02)
14. The last thing I want is to start chasing the future.
http://clump.diaryland.com/011014_55.html (accessed 20/11/02)

Although E is not in the MML, we have included it as an additional category, since many examples of this kind were found in our web search.

F. Time and the observer are in a race (neither is necessarily ahead)

15. ...but time beat me to it.
<http://www.stanford.edu/~kaleb/party/background.html> (accessed 20/11/02)
16. ...the immune system begins a race against time.
<http://www.pfizer.com/ah/stelresp/raceagainstime.html> (accessed 20/11/02)
17. Organisations that fail to keep pace with time...
http://www.tips4me.com/preview_main.asp?tip=corporate_h (accessed 20/11/02)
18. ...by not keeping abreast of the deadlines...
http://www.kentlaw.edu/hrc/cases/html_cases/1995/may/motsinge.oad.html
(accessed 20/11/02)

Many examples of this kind were found, too – where time and the observer are presented as racing against each other, without any necessary commitment to which is ahead.

G. Time/events as a river/bearer

19. Time carries us forward...
http://www.kenyon.edu/publications/bulletin/22_1/cn/70s.phtml
(accessed 20/11/02)
20. ...swept along by time and history...
<http://www.ucpress.edu/books/pages/1003.html> (accessed 20/11/02)
21. ...Joan was carried along by events.
<http://www.orlok.com/rewrite.html> (accessed 20/11/02)

This, too, is a very common metaphor which does not appear in the MML. Lakoff and Johnson (1999) say that "...we speak of *the flow of time* and often conceptualize the linear flow of time ... [as] ... a river" (p.144), but they appear to view the river as flowing past the observer rather than carrying the observer along with it.⁶

It is worth noting here that either "time" or "events" can be seen as carrying the observer along. In that case there might be three potential "movers" – time, events and observers, allowing many possible combinations of movement and directions of movement. We have grouped the two notions together in a single category, but there may be an important distinction here, apparently not noticed by Lakoff and Johnson, which should be further explored (we make a start on this in category J below).

H. Time can vary its pace

22. Time is slowing down...

http://www.occamproductions.com/index_old.asp?ArticleID=8
(accessed 20/11/02)

23. Time is speeding up...

<http://www.ambafrance-au.org/media/pages/1998/0198.en.htm>
(accessed 20/11/02)

24. Time is accelerating...

<http://www.linezine.com/7.2/articles/jcttl.htm> (accessed 20/11/02)

It could perhaps be argued that these examples could be classified as (C) "Time is something moving towards you". The reason we have introduced a new category is that, unlike the examples in (C), no reference is made here to an observer. If one were to try to imagine an observer in (22)-(24), there would be no indication of whether the time was moving relative to the observer, or whether the observer was moving with time – perhaps being carried along by "the river of time" as in G.

I. Times/events rise to the surface

25. Events bubbling up to affect history...

http://interconnected.org/home/2001_11_11_archive.shtml (accessed 20/11/02)

26. There are new events surfacing all the time.

<http://www.mvhs.net/~cs/2ktech/rbms/> (accessed 20/11/02)

27. And were it not for some seemingly unrelated events surfacing in the next eight decades...

<http://www.organicconsumers.org/madcow/nightmare21802.cfm> (accessed 29/01/02)

This is another relatively common metaphor for events, although we did not find any examples with "times". We have included 'time' in the category name nonetheless, since times and events appear to be interchangeable in many of the other models.

⁶ They do not make this explicit in the text, but it is implied by their referring to this metaphor as "a minor variation of the Moving Time metaphor" (Lakoff and Johnson 1999: 144).

A possible interpretation of the notion of events bubbling up and events surfacing is that of the events coming to someone's attention, i.e. "rising to the surface of their mind". Although this is plausible, it is clear from the surrounding context of (25)–(27) that this interpretation is not the intended one in any of these cases. (25) is speaking of the way that the world changes, sometimes by a gradual process and sometimes by means of sudden events. (26) is talking about a particular kind of event – competitions between robots – and simply refers to the occurrence of many such new events. (27) is discussing the occurrence of cases of Creutzfeldt Jakob disease and related diseases.

It might be possible to analyse these examples as a special case of the "Time is something moving towards you" model (perhaps combined with "Time is a container"). We have resisted this move because, once again, these examples do not give any information about the position or motion of the observer. It could be assumed that the observer is positioned at the surface, but this is not at all clear. A second argument against subsuming this category in "Time is something moving towards you" is that the scenario presented here is much more specific and detailed, and does not really fit the "horizontal motion" component of (C).

J. Events move relative to times (and possibly relative to each other)

28. As events race towards their inevitable conclusion...

<http://www.matt.gaynor.btinternet.co.uk/WHOREVIEWS/BUNKERSOLDIERS.htm>
(accessed 20/11/02)

29. ...events move forward through centuries of human history.

<http://www.cfdevotionals.org/devpvg01/de010714.htm> (accessed 20/11/02)

(29) is interesting in that it conveys the notion of events moving through time. The sense conveyed by the passage appears to be that of the unfolding or development of some kind of plan. Thus it could perhaps be argued that it is not the events themselves that as seen as moving with respect to time, but rather that there is a notion of progress, as in 'let's get things moving'. A deeper analysis of this metaphor is clearly needed.

K. Events follow each other in sequence

30. Events followed events rapidly...

<http://www.natchezbelle.org/udc/tupelo/tupalo1.htm> (accessed 20/11/02)

Notice that in neither J nor K is any reference made to the observer.

All of E-K are new categories which are not present in the MML. These new categories cannot be subsumed in any obvious way under any of the existing MML categories (at least without significantly broadening/generalising these categories, or postulating sub-categories that are so rich and different from the examples presented by Lakoff that they deserve separate categorisation). Our first observation is, therefore, that the MML is an incomplete⁷ listing of metaphors for time as revealed in our mundane discourse in English – an important result.

Further work is clearly needed, then, to determine the full set of temporal metaphors. Clearly, this work will need to be cross-linguistic in order to achieve the full picture. It will be very

⁷ The authors do not make any explicit claims as to its completeness. Nor do we make any claims as to the completeness of our list.

interesting to discover which (if any) of the spatio-kinetic temporal metaphors are shared across all languages, and which are specific only to some. Similarly, we should investigate the range of temporal metaphors used in literary and specialist discourse. But even confining ourselves to mundane discourse in English, it seems highly probable that other temporal metaphors will be discovered. Given the increased number of categories, it will probably be desirable, once we are sure that we have a (reasonably) complete set of categories, to group and organise them in some way. It is not at present clear to us on what basis this should be done. Perhaps looking at which ones can readily be combined (on an intra-clausal or intra-sentential basis, for example) will throw some light on this. We suspect, too, that the time/event distinction could provide an important fulcrum for classification.

As a preliminary exercise and merely to point the way to further development, we have attempted to group the metaphors which we found in our survey, using intuitive criteria. It allows us to classify cases where certain factors are underspecified – for example, cases where it is not clear if both the observer and time are moving, or just one or the other. Also, it produces a relatively small set of six metaphors. We are not claiming that it is the best way – especially as there may well be more temporal metaphors to be discovered.

- I. Time as a bounded container (no necessary movement within it) [A]
- II. Time/events and observer facing and moving towards to each other (either may be stationary) [B, C]
- III. Time/events and observer facing same direction and moving in same direction. The speed of the observer and the speed of time/events are independent of each other [D, E, F]
- IV. Observer moving at same speed and in same direction as time/events – i.e. the observer is constrained to move at the same speed as time/events (carried along by them) [G]
- V. Time moves – and may change speed – with no reference to an observer [H]
- VI. Events/times are ordered and/or move relative to each other (no reference to observer) [J, K]

As argued above, it seems sensible to group B and C together to form category (II).

There are strong similarities between the notion of “landscape” and that of “container”. The main difference between A (“Time is bounded container”) and B (“Time is a landscape we move through”) is that only B has the observer moving. Having combined B and C to form (II), this leaves (I) (formerly A) as a category which contains the notion of time as something bounded (this could be seen either as a container or as parts of a landscape), but where there is no implied movement.

Similarly, it makes sense to group categories D, E and F to form (III), given that it is not always clear whether the observer is stationary or moving (see examples (8) and (9)), or whether the observer or time/events is/are ahead (see examples (15) – (18)).

Although (III) and (IV) are similar in the both involve the observer facing and moving in the same direction as time, the crucial difference is that in (III) there is the notion of pursuit/racing (i.e. time and the observer are travelling at different speeds), while in (IV) the idea is that the observer is travelling at the same speed as time (by virtue of being “carried along”).

Although we have made no real effort to distinguish between times and events, it does seem likely, as we remarked earlier, that the event/time distinction may be important. We have not

pursued this here, since attempting to make the distinction would increase the number of categories still further. Moreover, in some cases it is almost impossible to decide whether a time or an event is being referred to. For example, does a commonly-used expression like ‘the beginning of term’ refer to a time or an event? Lakoff and Johnson (1999) speak of an event-for-time metonymy, where the event is taken to refer to the time (they give the example ‘The Kronos Quartet Concert is approaching’, p.154) – but it is not clear that this is the only way to explain such examples.

Our main conclusion from this section is that, even if we confine ourselves to spatio-kinetic metaphors for time, we need to extend the MML to include more categories. It seems highly likely, given the fairly cursory nature of our search, that the list is still incomplete and there are further categories of this type to be discovered. Some grouping of categories may well be needed, but it is not yet clear on what basis this should be done.

4. Mixing temporal metaphors

We will now address the question of whether, and to what extent, it is possible to “mix” temporal metaphors in discourse. Of course we will need to define exactly what we mean by mixing. In the extract presented in Section 2 (Leakey & Lewin 1992: 62-63), we saw a number of examples where distinct temporal metaphors are present in the same sentence. We propose, however, to concentrate mainly on examples where distinct temporal metaphors are present in the same clause.

We will present a number of examples, again discovered by searching the Web, where this kind of mixing of spatio-kinetic metaphors for time occurs.

We will confine ourselves, once again, to mundane discourse (plus one example from a poem, included because it is particularly interesting, as well as being written in a relatively mundane and non-literary style).

Mixed-Example (i)

As the unrelenting passage of time carries us into another "holiday season", be sure to consider your pet's needs, too.

<http://168.144.44.71/thompsonanimalhospital/articles/h.htm>

(Accessed 18/11/02)

This appears to be a mix of “time as bearer” (G) and “time as a container” (A). These two metaphors seem to blend together particularly well, and a number of other similar examples were found.

Mixed-Example (ii)

The rush of time carries us past many landmarks.

<http://www.angelfire.com/nh/emhi/craigonchamp.html>
(Accessed 18/11/02)

This appears to be a mix of “time as bearer” and “time (or events) as a landscape”. Once again, the mix sounds very natural, and many examples of this kind of mixing were found.

Mixed-Example (iii)

Racing against the end of his term on January 20, US President Bill Clinton has begun determining if there was enough common ground for new Middle East peace negotiations in the next fortnight.

<http://www.aniin.com.news7.htm>
(Accessed 18/3/02 – no longer available)

This can be seen as a mix of “time and the observer are in a race” and “time as a container” (‘on January 20’). Only a few examples of this kind were found, although once again, the combination sounds very natural.

Mixed-Example (iv)

*As a kid each year on Halloween he'd powder his face, makeshift fangs from a popsicle stick, dab some red magic marker blood, then prowl the streets, **racing against the coming of the dawn.***

http://www.creativestudios.com/lit/poets/a_buttagli/
(Accessed 18/11/02)

This appears to be a mix of “time is something moving towards you” (‘coming of the dawn’) and “time and the observer are in a race” (‘racing against...’). On the other hand, it is possible, perhaps, that the dawn is seen as approaching from behind the observer, and the observer is racing to keep ahead of it – which involves only the “race” model. However, most people we have asked share the intuition that the dawn is still pictured as moving towards the observer. If this intuition is robust, then we appear to have a genuine case of mixed temporal metaphor where the mix gives rise to an inconsistency. One intriguing suggestion is that this inconsistency could be resolved by picturing two runners racing from different directions to grab a target object – although this would not be a typical race – perhaps a somewhat metaphorical use of ‘race’. Our own feeling is that this inconsistency, if there is one, is not apparent when reading the passage – it only emerges when one stops to think about it and attempts to “picture” the scene. This raises a number of issues about imagery in metaphor comprehension, which it is not possible to investigate here. It would be very interesting to conduct psychological experiments to discover how people interpret this mixed metaphor, perhaps testing their comprehension both before and after being asked to picture the scene.

It should be noted that this example is actually part of poem, which disqualifies it from the category of mundane discourse. We feel justified in including it here, however, as the poem is written in a semi-colloquial and non-literary style, and it seems reasonable to assume that it would be readily understood if found in mundane discourse.

Interestingly, there is no obvious incoherence in any of the above examples. Of course, this is not entirely surprising, given that a corpus study tends to turn up, in the main, positive (acceptable) rather than negative (unacceptable) linguistic examples. A further study might involve attempting to construct examples of (intra-clausal) mixed metaphors across all combinations of categories, and testing the results for comprehensibility and coherence. One could also set out to look for examples of all the possible mixes in a corpus study, though this would be an extensive task, and it is doubtful what kind of conclusions, if any, could be drawn from the lack of examples of particular mixes.

Let us now turn to look at some examples of mixing where more than one clause is involved. We might expect not to find any incoherence here, if we assume that a hearer can readily switch metaphors between clauses. Examples were found, however, of extra-clausal mixes that are difficult to understand and do sound rather odd.

Mixed-Example (v)

The years roll by and our journey through time carries us relentlessly forwards.

<http://www.batej93.fsnet.co.uk/a976&1977.htm>
(Accessed 18/3/02 – no longer available 22/11/02)

Here we appear to have a mix of “time as something moving towards you” (“the years roll by”) and “time as a bearer” (or at least our journey through time as a bearer, which is slightly different).

According to our intuitions, the meaning is clear and the image is coherent as long as one pictures the years rolling “towards” the observer, while at the same time the “journey” carries the observer in the opposite direction, to meet the years. The resulting coherence here offers further support for combining categories B and C.

Once again, however, this needs to be tested on subjects in a properly controlled experimental setting.

Mixed-Example (vi)

Time hurries on as the resistless, unremitting stream, but our yesterdays follow us. They constitute our life, and they give character and force and meaning to the present.

<http://www.pgsa.org/pncpar1.htm>
(Accessed 18/11/02)

We found this example quite difficult to analyse in terms of the set of categories above, as well as quite difficult to understand. Clearly a “time as movement” metaphor is being used, but it is not clear to us whether the observer is conveyed as moving with time (as in the “Time as a bearer” metaphor) or whether the stream of time is to be seen as flowing past the observer. ‘Our yesterdays follow us’ conveys that both the observer and time are in motion, in the same direction, suggesting that “Time is a pursuer” (D(ii)) is being used here. It is difficult to envisage a scene involving both these scenarios. Perhaps this explains the difficulty in understanding (if, indeed, this is an intuition shared by others). But in the example (v) above, switching metaphors between clauses appeared to present no such problem. One explanation might be that the second metaphor in (vi) is relatively unusual and non-standard⁸, and that in order to process it we need to picture the appropriate scene – while in (v), and also (iv), the temporal metaphors are both sufficiently familiar for their meanings to be stored lexically, with no requirement on the hearer to construct an appropriate visual scene to reason about. But this is all highly speculative, and once again, much further work is needed to understand what is happening in these examples.

To conclude this section, it appears that temporal metaphors may be mixed, both intra-clausally and extra-clausally but within the same sentence, in a number of ways. A number of combinations result in comprehensible and coherent results. In some cases, the meaning appears to be clear until we attempt to visualise the appropriate scene (although of course the initial clarity may be a delusion resulting from careless processing). Further studies will, it is hoped, reveal a great deal more about how temporal metaphors may and may not be mixed. The results may well help us to decide how what is now a relatively long list of spatio-kinetic temporal metaphors should be further classified and regrouped.

5. The temporal structure of discourse

Finally, we will briefly consider the contribution made by temporal metaphors to our understanding of the temporal structure of discourse.

Determining the temporal structure of spoken and written discourse has been found, in a multitude of studies over many years, to be no trivial task. The question of how events and states are temporally related in the described domain has been shown to depend on a number of interacting factors, including tense, temporal adverbials (e.g., Kamp and Reyle 1993), aspect or “viewpoint” (Smith 1991), aspectual class (Vendler 1967), (Moens and Steedman 1988), (Verkuyl 1972), (Verkuyl 1993), world knowledge (Lascarides and Asher 1993), discourse structure signals including adverbs like ‘when’ (Moens and Steedman 1988), (Sandström 1993), ‘then’ (Glasbey 1993) – and so on. If we wanted, for example, to create a computational system capable of inferring temporal structure from text, we would need to consider all these factors and the multiple interactions between them.

But even if we developed an analysis involving all the above factors, we would still be far from having a complete account of the temporal relations conveyed by text. The reason is the subject of this paper – the prevalence of temporal metaphor in spoken and written discourse. We hope that the examples given help to convince the reader that the temporal metaphors we use when we

⁸ Although the metaphor “time is a pursuer” is a familiar one, the idea of being pursued, presumably in an ordered, orderly fashion by “our yesterdays”, as opposed to being pursued by times/events which are seen as “chasing” us, is perhaps relatively novel. It could be seen, however, as related to metaphors like ‘dogged by history’.

speak and write make a significant contribution to the temporal structure of discourse. If anyone is unconvinced, we suggest removing the temporal metaphors from the (Leakey & Lewin 1992) passage and then attempting to comprehend its temporal structure. Another useful exercise is to try to rewrite such a passage without using temporal metaphors of any kind. One soon becomes convinced that they are intrinsic to much of the way we speak about time, and that it is often very difficult to paraphrase them without using metaphor.

It seems clear, then, that any analysis of the temporal structure of discourse must account for the part played by temporal metaphor. In particular, the spatio-kinetic metaphors on which we have focused in this paper seem to make a substantial contribution to our understanding of the ordering and overlap relations between times and events. Computational systems which attempt to derive temporal information from documents will need to be able to reason about temporal metaphors. We are currently working on the integration of temporal reasoning into the ATT-Meta system for metaphorical reasoning (Barnden & Lee 1999), mentioned earlier. In the future, we hope to include a wide range of temporal metaphors in the ATT-Meta system, and to develop a means of processing mixed temporal metaphor, based in part on the treatment of mixed metaphor in (Lee & Barnden 2001).

6. Conclusion

In this paper we have shown that temporal metaphor is very common in mundane discourse, and that further study is needed to determine the full range of temporal metaphors in common use. The MML and related work by Lakoff and Johnson identify a number of prominent temporal metaphors, but there are clearly many more. We have shown, too, that temporal metaphors may often be mixed within the same clause, and that the results are often fully coherent – or at least apparently so on a quick reading. There are some interesting exceptions, however. Work is needed to determine which combinations are possible, and in what circumstances. Finally, we have shown that if we are to develop satisfactory analyses of the temporal structure of discourse, then these must include accounts of the contribution made by temporal metaphors (and in particular, the spatio-kinetic temporal metaphors highlighted in this paper). Any computational system which can derive information about the temporal relations between described states and events must be able to process temporal metaphors and reason about their content. By giving some pointers to what needs to be done, we hope that this paper will help to encourage further work in these important areas.

References

- Barnden, J. A. & M. G. Lee. 1999. An implemented context system that combines belief reasoning, metaphor-based reasoning and uncertainty handling. In P. Bouquet, P. Brezillon & L. Serafini, Eds. *Second International and Interdisciplinary Conference on Modeling and Using Context* (Context '99), Lecture Notes in Artificial Intelligence, Vol. 1688: 28-41. Springer.
- Glasbey, S. 1993. Distinguishing between events and times: some evidence from the semantics of 'then'. *Natural Language Semantics* 1(3): 285-312.

Kamp, H. & U. Reyle. 1993. *From Discourse to Logic: Introduction to the Modeltheoretic Semantics of Natural Language, Formal Logic and Discourse Representation Theory*. Dordrecht: Kluwer.

Lakoff, G. The Master Metaphor List (MML) (<http://cogsci.berkeley.edu/targets/Time.html>). [Accessed 10/11/02]

Lakoff, G. & M. Johnson. 1980. *Metaphors we Live by*. Chicago: The University of Chicago Press.

----- & -----. 1999. *Philosophy in the Flesh*. New York: Basic Books.

Leakey, R. and R. Lewin. 1992. *Origins Reconsidered*. London: Little, Brown and Company.

Lee, M.G. & J. A. Barnden. 2001. Reasoning about mixed metaphors with an implemented AI system. *Metaphor and Symbol*, **16** (1&2): 29-42.

Lascarides, A., and N. Asher. 1993. Temporal interpretation, discourse structure and commonsense entailment. *Linguistics and Philosophy* **16**: 437-493.

Mandik, P. 1998. Objectivity without space.
<http://www.phil.indiana.edu/ejap/1998/mandik98.html>. EJAP, Philosophy Department, Indiana University, Bloomington, Indiana, USA.

Moens, M. and M. J. Steedman. 1988. Temporal ontology and temporal reference. *Computational Linguistics* **14**(2): 15-28.

Sandström, G. 1993. *When-clauses and the temporal interpretation of narrative discourse*. Technical Report 34, Department of General Linguistics, University of Umeå, Sweden.

Smith, C. 1991. *The Parameter of Aspect*. Dordrecht: Kluwer Academic Publishers.

Strawson, P. 1959. *Individuals: An Essay in Descriptive Metaphysics*. London: Methuen.

Vendler, Z. 1967. Verbs and Times. In *Linguistics in Philosophy*: 97-121. Ithaca, N.Y: Cornell University Press.

Verkuyl, H. J. 1972. *On the Compositional Nature of the Aspects*. Dordrecht: D. Reidel.

----- . 1993. *A Theory of Aspectuality. The Interaction between Temporal and Atemporal Structure*. Cambridge Studies in Linguistics, Vol 64. Cambridge: Cambridge University Press.

Wallington, A.M., Barnden, J.A., Glasbey, S.R., Lee, M.G. 2003. Metaphorical reasoning with an economical set of mappings. Ms, School of Computer Science, University of Birmingham, UK. Submitted to *Delta*, January 2003.