

A DRT ANALYSIS OF A FAMOUS FRAGMENT FROM *THE LITTLE PRINCE*

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Abstract

Accounting for temporal anaphora in the theory of Discourse Representation, first presented by Hans Kamp (e.g. Kamp & Schielen (2001), see also Kratzer (1998), ter Meulen (1995), (2000)), this paper presents a small fragment from *Le Petit Prince* as a proof of principle or a demonstration of what ought to be automated in an implementation of the DRT principles by a sufficiently smart system of natural language processing, if it is able to reason about time and temporal relations in some approximation of what we ordinary human beings ideally are capable of.

1. INTRODUCTION

The following ten representational principles of the dynamics of temporal relations in discourse are employed in the analysis:

- 1) Every phrase with an inflected IP introduces a new temporal reference marker, which must be related by temporal precedence or inclusion to given event- or state-reference markers or the current reference or speech time.
- 2) Past tense IPs require their reference marker to precede the now/current speech time.
- 3) Present tense or present perfect tense IPs require their reference marker to include the now/current speech time.
- 4) Past perfect IPs require their event reference marker to precede the last given event reference marker.
- 5) State (S) reference markers (s_n) include the given current reference time (r_n).
- 6) Activities (ACT) include a new accomplishment (ACC) event marker, unless this violates global Consistency or Coherence conditions.
- 7) Accomplishments introduce an event reference marker preceded by the last introduced accomplishment event reference marker, unless its presuppositions, Consistency or Coherence conditions require temporal inclusion.
- 8) When (7) is applied, a later reference time must be introduced to update the current reference time with this event marker (7) introduced.

- 9) Quoted phrases are identified with a new event marker, preceded by the last introduced event reference marker and preceding the next event reference marker to be introduced by the subsequent IP in discourse.
- 10) Negation, progressives, modals, future tenses and conditionals introduce stative reference markers.

For a proper theory of our human cognitive capacity for temporal reasoning, this representational system should be complemented with explicit inference rules. They would allow you, for instance, to conclude at any point in the interpretation on the basis of any past event reference marker that subsequently the corresponding perfect state held, or that at an event reference marker other event markers including it support an inference with a corresponding present progressive IP as conclusion. To illustrate the first inference in the given text: after processing (10 - (12) you can infer that when he told the chap (e_6), he **had taken** his fountain-pen out of his pocket (e_5). The second inference may be illustrated by drawing the conclusion from processing (1) – (6) that I **was staring** at him (e_1), when I said: "But-- what are you doing here?" (e_3).

It would lead too far astray from the present purposes of this contribution to the Festschrift for Jacques Moeschler to spell out these sorts of rules of temporal reasoning in a dynamic representation of temporal anaphora in discourse in all requisite formal detail. But these two examples serve only as simple and straightforward cases of how we adjust the tense and aspect of the IP in stating the conclusion, depending on how exactly the current context has changed from the context in which its premises were initially given. Such adaptations are part and parcel of our linguistic competence, and as such constitute a core subject of linguistic investigations. For further reading, the interested reader is referred to ter Meulen (2007), (2010), (2012) and (2013), which include an account of the logical interaction of aspectual classes with aspectual verbs and adverbs.

1.1. Analysis

...

(1) Now I **stared** at this sudden apparition with my eyes fairly starting out of my head in astonishment.

(2) Remember, I **had crashed** in the desert a thousand miles from any inhabited region.

(3) And yet my little man **seemed** neither to be straying uncertainly among the sands, nor to be fainting from fatigue or hunger or thirst or fear.

(4) Nothing about him **gave** any suggestion of a child lost in the middle of the desert, a thousand miles from any human habitation.

$\text{stare}_{\text{ACT}}(e_1) < \text{now}$

$e_1 = r_1$

$\text{crash}_{\text{ACC}}(e_2) < e_1$

$\text{seem}_{\text{STA}}(s_1) \supset r_1$

$\text{seem}_{\text{STA}}(s_1) < \text{now}$

$\sim \text{give}_{\text{STA}}(s_2) < \text{now}$

$\sim \text{give}_{\text{STA}}(s_2) \supset r_1$

$\text{say}_{\text{ACC}}(e_3) < \text{now}$

$e_1 \supset \text{say}_{\text{ACC}}(e_3)$

- (5) When at last I was able to speak, I *said* to him:
 (6) "But-- what are you doing here?"
 (7) And in answer he *repeated*, very slowly, as if he were speaking of a matter of great consequence:
 (8) "If you please-- draw me a sheep..."
 (9) When a mystery *is* too overpowering, one *dare not* disobey.
 (10) Absurd as it *might seem* to me, a thousand miles from any human habitation and in danger of death, I *took* out of my pocket a sheet of paper and my fountain-pen.
 (11) But then I *remembered* how my studies *had been* concentrated on geography, history, arithmetic, and grammar,
 (12) I *bold* the little chap (a little crossly, too) that I did not know how to draw.
 (13) He *answered* me: "That doesn't matter. Draw me a sheep..."
 (14) But I *had never drawn* a sheep.
 (15) So I *drew* for him one of the two pictures I had drawn so often.
 (16) It *was* that of the boa constrictor from the outside.
 (17) And I *was astounded* to hear
 (18) the little fellow *greet* it with, "No, no, no! I do not want an elephant inside a boa constrictor. A boa constrictor is a very dangerous creature, and an elephant is very cumbersome. Where I live, everything is very small. What I need is a sheep. Draw me a sheep."
 (19) So then I *made* a drawing.
 (20) He *looked* at it carefully,

"But ...here?" = e_3
 $e_3 < \text{repeat}_{\text{ACC}}(e_4)$
 $e_4 = r_2$
 $\text{repeat}_{\text{ACC}}(e_4) < \text{now}$

"If ... sheep..." = e_4
 $[\text{be}_{\text{STA}}(s_3) \Rightarrow \sim \text{dare}_{\text{STA}}(s_4)] \supset \text{now}$
 $[\blacklozenge \text{seem}_{\text{STA}}(s_5)] \supset \text{now}$
 $e_4 < \text{take}_{\text{ACC}}(e_5)$
 $\text{take}_{\text{ACC}}(e_5) < \text{now}$
 $e_5 = r_3$
 $\text{remember}_{\text{STA}}(s_6) \supset r_3$
 $\text{remember}_{\text{STA}}(s_6) < \text{now}$
 $\text{be}_{\text{STA}}(s_7) < r_3$
 $e_5 < \text{tell}_{\text{ACC}}(e_6)$
 $\text{tell}_{\text{ACC}}(e_6) < \text{now}$
 $e_6 = r_4$
 $e_6 < \text{answer}_{\text{ACC}}(e_7)$
 $\text{answer}_{\text{ACC}}(e_7) < \text{now}$
 $[\square \sim \text{draw}_{\text{ACC}}(e_8)] < e_7$
 $e_7 < \text{draw}_{\text{ACC}}(e_9)$
 $\text{draw}_{\text{ACC}}(e_9) < \text{now}$
 $e_9 = r_5$
 $\text{be}_{\text{STA}}(s_8) \supset r_5$
 $\text{be}_{\text{STA}}(s_8) < \text{now}$
 $\text{be astounded}_{\text{STA}}(s_9) \supset r_5$
 $\text{be astounded}_{\text{STA}}(s_9) < \text{now}$
 $e_9 < \text{greet}_{\text{ACC}}(e_{10})$
 $e_{10} = r_6$
 "No, ... sheep." = e_{11}

(21) then he *said*: "No. This sheep is already very sickly.
Make me another."

(22) So I *made* another drawing.

(23) My friend *smiled* gently and indulgently.

(24) "You see yourself," he *said*, "that this is not a sheep.
This is a ram. It has horns."

(25) So then I *did* my drawing over once more.

(26) But it *was rejected* too, just like the others.

(27) "This one is too old. I want a sheep that will live a long
time."

(28) By this time my patience *was exhausted*,

(29) because I *was* in a hurry to start taking my engine apart.

(30) So I *tossed off* this drawing.

(31) And I *threw out* an explanation with it.

(32) "This is only his box. The sheep you asked for is
inside."

(33) I *was* very surprised to see a light break over the face of
my young judge:

(34) "That is exactly the way I wanted it! Do you think that
this sheep will have to have a great deal of grass?"

(35) "Why?"

(36) "Because where I live everything is very small..."

(37) "There will surely be enough grass for him," I *said*. "It

$e_{11} < \text{make}_{\text{ACC}}(e_{12})$

$\text{make}_{\text{ACC}}(e_{12}) < \text{now}$

$e_{12} = r_7$

$e_{12} < \text{look}_{\text{ACT}}(e_{13})$

$\text{look}_{\text{ACT}}(e_{13}) < \text{now}$

$e_{13} = r_8$

$e_{13} \supset \text{say}_{\text{ACC}}(e_{14})$

$\text{say}_{\text{ACC}}(e_{14}) < \text{now}$

"You... horns." = e_{14}

$e_{14} < \text{do}_{\text{ACC}}(e_{15})$

$\text{do}_{\text{ACC}}(e_{15}) < \text{now}$

$e_{18} = r_{10}$

$\text{be rejected}_{\text{STA}}(s_8) \supset r_{10}$

$\text{be rejected}_{\text{STA}}(s_8) < \text{now}$

$\text{be exhausted}_{\text{STA}}(s_9) \supset r_{10}$

$\text{be exhausted}_{\text{STA}}(s_9) < \text{now}$

$\text{be in a hurry}_{\text{STA}}(s_{10}) \supset r_{10}$

$\text{be in a hurry}_{\text{STA}}(s_{10}) < \text{now}$

$e_{18} < \text{toss off}_{\text{ACC}}(e_{19})$

$\text{toss off}_{\text{ACC}}(e_{19}) < \text{now}$

$e_{19} = r_{11}$

$e_{19} < \text{throw out}_{\text{ACC}}(e_{20})$

$\text{throw out}_{\text{ACC}}(e_{20}) < \text{now}$

$e_{20} = r_{12}$

"This ... inside." = e_{20}

$\text{be surprised}_{\text{STA}}(s_{11}) \supset r_{12}$

$\text{be surprised}_{\text{STA}}(s_{11}) < \text{now}$

"That ... grass?" = e_{21}

$r_{12} \supset e_{21}$

is a very small sheep that I have given you."
 (38) He *bent* his head over the drawing:
 (39) "Not so small that-- Look! He has gone to sleep..."
 (40) And that *is* how I made the acquaintance of the little prince.
 ...

"Why?" = e_{22}
 $r_{12} \supset e_{22}$
 $e_{21} < e_{22} < e_{23}$
 "Because ... small..." = e_{23}
 $r_{12} \supset e_{23}$
 $e_{23} < \text{say}_{\text{ACC}}(e_{24})$
 $\text{say}_{\text{ACC}}(e_{24}) < \text{now}$
 $r_{13} = e_{24}$
 "There ... him, It ... you " = e_{24}
 $e_{24} < \text{bend}_{\text{ACC}}(e_{25})$
 $\text{bend}_{\text{ACC}}(e_{25}) < \text{now}$
 $r_{14} \supset e_{25}$
 "Not ... sleep..." = e_{26}
 $e_{25} < e_{26}$
 $r_{16} = e_{26}$
 $\text{be}_{\text{STA}}(s_{12}) \supset \text{now}$

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