The Negation of Events

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Overview

Introduction

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Time Representation

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Yet we want (4) not to be contradictory.

(4) Jones loved a women and he doesn't love a woman.

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$\Rightarrow$ very powerfull (Kamp, 1979)
what about present tense?
aspect?

Time Representation: temporalized predicates

(8) a. Jones loved a woman.

b. $\exists t \exists x \;\; t < n \wedge \text{woman}(x) \wedge \text{love}(j, x, t)$

- Predicates have one additional place for time
- Underspecified role of the time argument

Time Representation: second order formulae

(9) a. Jones loves a woman.

b. $\exists t \;\; t < n \;\; holds\_at(t, [\exists x \; \text{woman}(x) \wedge \text{love}(j, x)])$

- usual in AI/KR
- too powerfull (decidability issues)
- many meaning postulates needed

Polyadicity

(10) a. Jones buttered the toast
b. $buttered(j, t)$

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as well as (11-a) $\Rightarrow$ (12)

(12) a. Jones buttered the toast in the bathroom $buttered(j, t, b)$
b. Jones buttered the toast with a knife $buttered(j, t, k)$
c. Jones buttered the toast in the bathroom with a knife $buttered(j, t, b, k)$

Polyadicity II

Proposal (Kenny, 1963) : (10-a) shall be represented as a 5-ary predicate. In other words, (10-a) is seen as an elliptic/underspecified version of (13).

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Then the wanted inferences come through.
But what do we do with (14)? (Davidson, 1967)

(14) Jones buttered the toast in the bathroom with a knife at midnight by holding it between the toes of his left foot

Davidson's intuition

- Individuals

(15) a. I bought a house
b. $\exists x\ \mathrm{house}(x)$

Davidson's intuition

- Individuals

(15) a. I bought a house, it has three rooms
b. $\exists x\ \text{house}(x) \wedge 3\_\text{room}(x)$

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(15) a. I bought a house, it has three rooms, it is well-heated

b. $\exists x\ \text{house}(x) \wedge \text{3\_room}(x) \wedge \text{well\_heated}(x)$

Davidson's intuition

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(15) a. I bought a house, it has three rooms, it is well-heated , and has 2 storeys

b. $\exists x\ \text{house}(x) \wedge 3\_\text{room}(x) \wedge \text{well\_heated}(x) \wedge 2\_\text{storey}(x)$

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- (re)descriptions
- pronouns

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- (re)descriptions
- pronouns

- Events

(16) John did it slowly, deliberatly, in the bathroom, with a knife, at midnight. What he did was butter a piece of toast.

Reification of events

1. Action predicates have an additional, event, place (17).
2. Action sentences "have an existential quantifier binding the action[event] variable" (18). (Reichenbach, 1947)

(17) a. Kim kicked Sam.
b. $\mathrm{kick}(k, s, e)$

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(19) a. A man found a coin.
b. $\exists x \exists y \exists e\ \mathit{man}(x) \wedge \mathit{coin}(y) \wedge \mathit{find}(x, y, e)$

Discussion

- Which predicates have an event-place ?

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- Who denotes an event ? nominals (20)

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b. Caesar is dead : $\exists x\ \mathit{dead}(x, c)$

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- What's a sentence denotation ? t —no change
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$\Rightarrow$ Syntax-semantics interface to be worked out.

Discussion: individuation of events

Individuation at its best requires sorts or kinds that give a principle for counting. But here again, events come out well enough: rings of the bell, major wars, eclipses of the moon, and performances of Lulu *can be counted as easily as pencils, pots, and people. Problems can arise in either domain. The conclusion to be drawn, I think, is that the individuation of events poses no problems worse in principle than the problems posed by individuation of material objects; and there is as good reason to believe events exist.*

(Davidson, 1985, p. 180)

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- requires a richer lexicon, and an appropriate management of the syntax-semantics interface
- solves radically the polyadicity problems,
- and puts on a par arguments and adjuncts.

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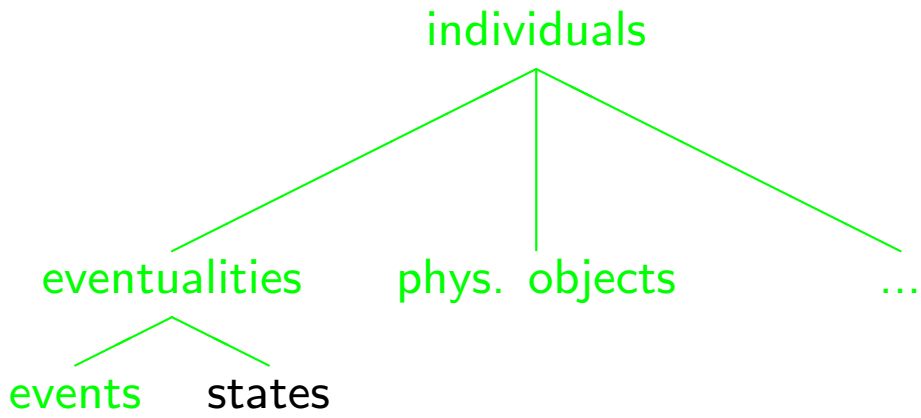
DRT I

"Realistic" approach to time & event representation

1. regularisation of the stx-sem interface
   $\Rightarrow$ Introduction of a new type.

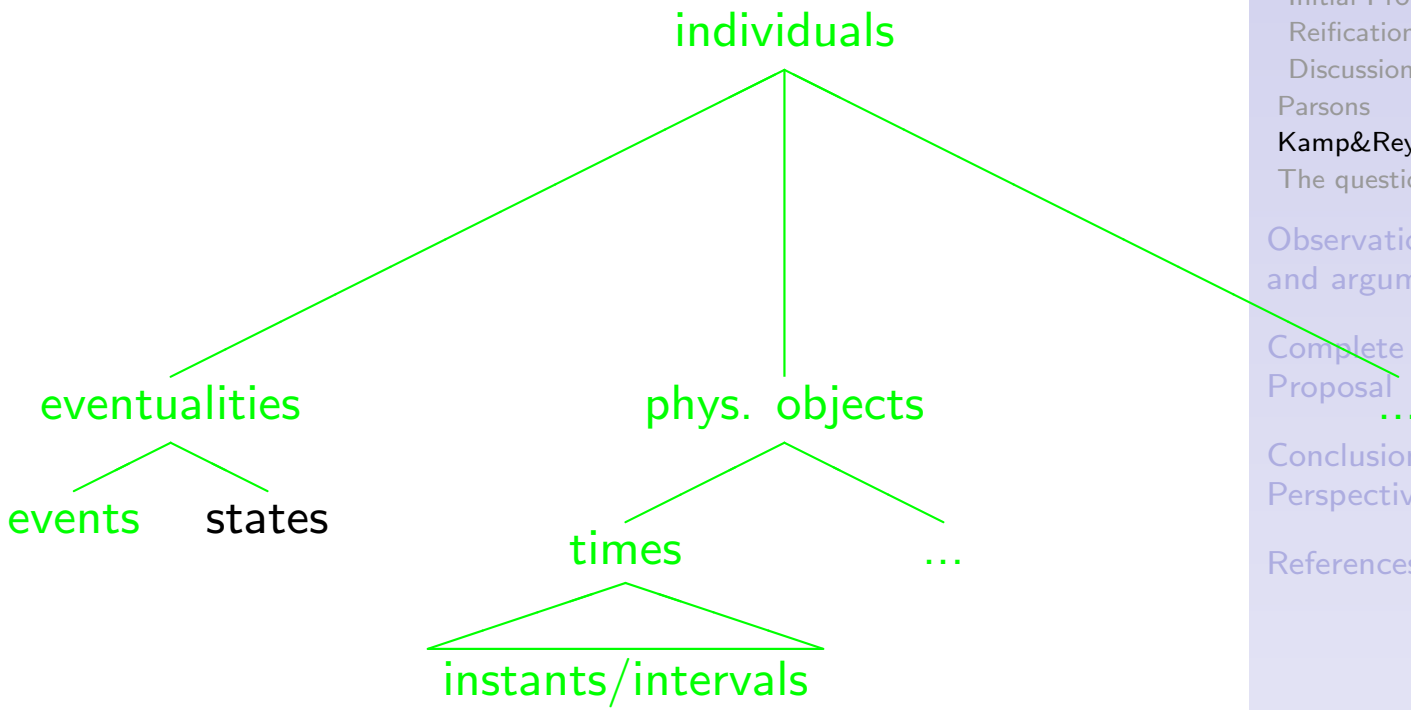
Ontology:



DRT II

2. Introduction of explicit "time constants"

Ontology:



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t is a time constant

Behavior of negated sentences?

Compare

(26) a. Jones owns a car.

b. $\exists x\ car(x) \wedge own(j, x)$

(27) a. Jones doesn't own a car.

b. $\neg\exists x\ car(x) \wedge own(j, x)$

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b. $\neg\exists x\ car(x) \wedge own(j, x)$

with

(28) a. Jones fell.
b. $\exists x\ fall(x) \wedge agent(x, j)$

(29) a. Jones didn't fall.
b. $\neg\exists x\ fall(x) \wedge agent(x, j)$

Too simple ??

Various observations suggested an alternative analysis:

(30) a. Jones didn't fall.
b. $\exists x$ non-fall$(x) \wedge agent(x, j)$

Questions:

- Nature of the new entity (normal event, normal state, special eventuality?)
- Structure of the representation
- Stx-sem interface
- Rôle of negation

Overview

(31) a. John didn't know the answer to the problem. This lasted until the teacher did the solution on the board.

b. John did not ask Mary to dance at the party. It made her angry. *(de Swart, 1996)*

(32) a. Susan's boyfriend has graduated. But Sally does not believe it.

b. He is a brute. His behaviour shows this quite clearly. *(Przepiórkowski, 1999, ex(4))*

Causation Reports

(33) a. I kept the child awake by not turning out the light. *(Higginbotham, 2000)*

b. He didn't stop at the lights because he didn't notice them.

(34) a. The fact that John had a headache made him crabby.

b. John's crabbiness resulted in the fact that everyone avoided him. *(Asher, 1993)*

(35) John's rude answering of the phone was caused by his fight with his wife.
$\approx$ The fact that John answered in a rude manner was caused by ...
$\neq$ The rude phone-answering event was caused by ... *(Parsons, 1990)*

Perception Reports

(36) The policeman saw Andrew not stop for the traffic light. *(van der Does, 1991)*

(37) a. ? I saw Max not blink.
b. *Everybody could see the rain not fall.

(38) Everybody could see the president not singing the Marseillaise.

$\Rightarrow$ Positive counterpart needed

Event containers

Container: predicate posing a type constraint on its argument(s) (Vendler, 1967)

(39) What happened next was that the consulate didn't give us our visa. *(Horn, 1989)*

(40) a. ? What happened next was that Mary didn't snore.
b. *What happened next was that John didn't run.

(41) a. What happened next was that John didn't find his keys.
b. What happened next was that no one answered correctly.

$\Rightarrow$ Positive counterpart / expected event

Counting and Quantifiying over events

(42) a. He often hasn't paid taxes.
b. He sometimes doesn't eat dinner. *(de Swart, 1996)*

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Where is the quantifier ?

(43) a. John often/always comes by car.
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c. John often/always falls.
d. $\forall e\ C(e) \rightarrow \exists e'\ fall(e, j) \wedge R(e, e')$

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(44) a. John often doesn't pay taxes.
b. $\mathrm{OFT}e\ C(e) \rightarrow \neg\exists e'\ pay\_taxes(e', j) \wedge R(e, e')$

Counting and Quantifiying over events II

(45) Jones fell 3 times.

$\Rightarrow$ 3 events

(46) In all his life, [John didn't come to a party he was invited to] twice. It was actually on the same evening.
(Przepiórkowski, 1999)

(47) ?? In all his life, [John didn't sleep] twice.

Temporal Modification

(48) [John didn't play golf] until noon. *(Higginbotham, 2000)*

(49) [No one talked] for over two hours. *(Asher, 1993)*

Only temporal modification possible (see later).
Assuming a negative eventuality is not necessary with usual assumptions about time representation:

(50) a. $\exists e\ e : \boxed{\text{no one talk}} \wedge last(e, 2h)$

b. $\exists t\ length(t, 2h) \wedge \neg\exists e \exists x\ pers(x) \wedge talk(e, x) \wedge at(e, t)$

Manner and other modification

(51) a. *John slowly didn't butter a piece of toast.
b. *[John didn't butter a piece of toast] with a knife.
(Przepiórkowski, 1999)

Defining propertie of events according to Davidson (1967).
Counter-exemple from Przepiórkowski (1999):

(52) wczorajsze nieoczekiwane nieuznanie praw Kowalskiego do tej
yesterday.ADJ unexpected not-recognizing.PERF rights Kowalski's to this
posesji ...
immovable property ...
'the [unexpected [not recognizing Kowalski's right to this immovable property] yesterday] caused ...'

It's a nominal !

Reference time & Discourse

- "Only events move forward reference time"

(Kamp & Reyle, 1993)

(53) Mary smiled at John. He didn't smile back.

(de Swart & Molendijk, 1999)

(54) a. Il rentra chez lui. Puis il téléphona à son ami.
He came back home. Then he called his friend.

b. *Il ne rentra pas chez lui. Puis il téléphona à son ami.
He didn't come back home. Then he called his friend.

c. *Il rentra chez lui. Puis il ne téléphona pas à son ami.
He came back home. Then he didn't call his friend

(Amsili & Le Draoulec, 1998)

Temporal Subordination I

Temporal provide a reference through the introduction of an event.

(55) Max arrived (e_1) soon after Mary had fallen down (e_2).

(56)
a. Après qu'il lui a répondu, elle est partie.
After he answered her, she left
b. *Après qu'il ne lui a pas répondu, elle est partie.
After he didn't answer her, she left
c. Quand il a perdu ses clés, il a appelé un taxi.
When he lost his keys, he called a cab
d. *Quand il n'a pas trouvé ses clés, Marie est arrivée.
When he didn't find his keys, Marie came

Temporal Subordination II

(57) a. *While no one died in the hospital, nurses where satisfied.
b. *While Mary didn't eat the cake, John washed the dishes.
c. *Pendant que Jean n'a pas invité Marie à danser, les autres se sont bien amusés.
While Jean didn't ask Marie to dance, the others had much fun

- The constant t bears the durative predication in the *for*-examples

(58) a. Jane did not swim a mile for two hours.
b. No one died in the hospital for over two hours.

$\Rightarrow$ Explains why the reference time needs an explicit mention

Temporal Subordination III

(59) a. ? Après que John ne fut pas venu à la fête, Eva se mit en colère.
After John did not come to the party, Eva got angry

b. Après que, à minuit, John ne fut (toujours) pas venu à la fête, Eva se mit en colère.
After (that), at midnight, John (still) didn't come, Eva got angry

(60) a. $*$ Nous avions l'habitude de nous retrouver à cet endroit. Puis il ne vint pas.
We were used to meeting there. Then he didn't come.

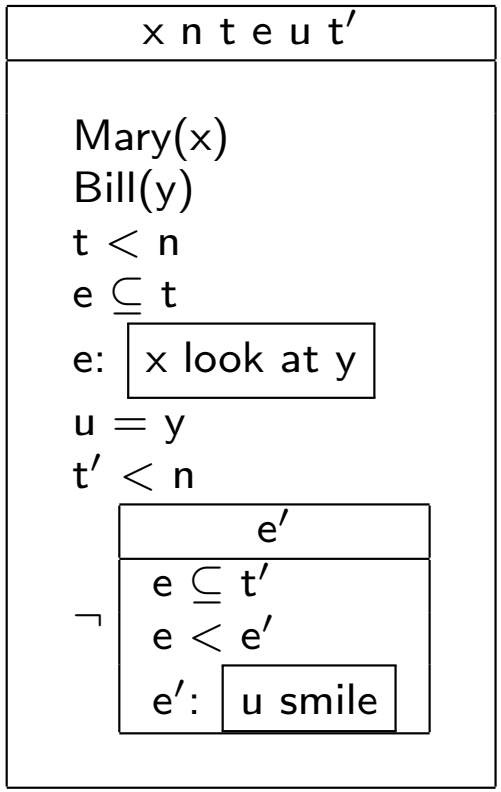
b. Nous avions l'habitude de nous retrouver à cet endroit. Puis un jour, il ne vint pas.
We were used to meeting there. Then, one day, he didn't come.

Overview

DRT

- Principle: For a negated sentence, introduce:

- a location time t;
- a condition relating t with **n** (TPpt) [$=$ or $<$];
- a condition saying that **there is no event or state** (of a certain type) which stands in the relation '$\subseteq$' or '$\bigcirc$' to t.



$K_{(61)}$

Stative negated sentences I

(62) a. On entendait du bruit. Jean entra avec précaution.
One heard noise. John came in cautiously

b. On n'entendait pas de bruit. Jean entra avec précaution.
One didn't hear noise. John came in cautiously

(63) a. While Mary wasn't at home, John washed the dishes.

b. Quand il ne vivait pas avec nous, tout était plus simple.
When he didn't live with us, everything was simpler

. . . but . . .

(64) a. Les gens ont bavardé jusqu'à ce que le soliste soit sur scène.
People have chatted until the soloist was on stage

Stative negated sentences II

b. *Le public est resté silencieux jusqu'à ce que le soliste ne soit pas sur scène.
The audience stayed silent until the soloist wasn't on stage

c. Depuis qu'il l'aime, on ne le voit plus.
Since he is in love with her, we don't see him any more

d. *Depuis qu'il ne l'aime pas, on le voit tous les jours.
Since he is not in love with her, we see him everyday

Proposal : a state is indeed available, but through *computation*. States are closed under *relative complementation* *(Asher, 1993, p. 52)*

Facts

(65) John did not ask Mary to dance at the party. It made her angry. *=(31-b)*

(66) a. Le train n'arriva pas. Cela m'inquiéta beaucoup.
The train didn't arrive. It worried me very much
b. Il ne trouva pas la réponse. Cela la déçut.
He didn't find the answer. This disappointed her

- Parallelism with *when*-sentences

(67) Quand il n'est pas sorti au bout de 5 minutes, j'ai compris qu'un accident avait du se produire.
When he didn't come out after 5 minutes, I understood an accident had probably happened

$\Rightarrow$ Discourse relation : *response* (Sandström, 1993)

- Propositionnal attitude verbs

The negative proposition is seen as a **fact** *(Asher 93).*

Overview

Conclusion

- William of Ockham wins !
  however. . .
- Linguistic issues
  - Cross-linguistic variations
  - Extrême variability of speakers judgments
  - Interaction with pragmatics
  - Nominals
- Representational issues
  - Respective roles in discourse structure of **t** and **e/s**.

(68) a. À huit heures (t), son réveil sonna (e_1).
Sa voisine frappa à la porte (e_2). $e_1 < e_2$
At eight, his alarm clock rang. His neighbour knocked at the door

b. À huit heures (t), son réveil ne sonna pas.
Sa voisine frappa à la porte (e_2). $t < e_2$
At eight, his alarm clock didn't ring.

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