Times and durative adverb modification*

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• Durative adverb modification (in- and for-adverbs)
• Durative adverbs measure the length of a time interval
• Flexibility in time intervals measured (event time or topic time)
• Properties of negated event predicates

1 Durative adverbs and times

1.1 Times
• Reichenbachian time structure

1.1.1 Types of times
• Event time
  – The duration of the event
• Topic time
  – Topic time (reference time)
  – The time interval under discussion
  – The relation of the topic time and event time determines perfective or imperfective viewpoint aspect
    * With perfective aspect, the event time is part of the topic time
    * With imperfective aspect, the topic time is part of the event time

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(1) a. \[\text{[perfective]} = \lambda P . \lambda t . \exists t' . [t' \subseteq t \& P(t')]\]
b. \[\text{[imperfective]} = \lambda P . \lambda t . \exists t' . [t \subseteq t' \& P(t')]\]

(based on Iatridou et al. 2001, von Fintel and Iatridou 2002)

- Speech time
  - Tense orders the topic time and the speech time

1.1.2 Structure and times
- Event time is associated with vP
- Topic time is associated with AspP
- Speech time is associated with TP

[other times (e.g. perfect or result time) are also possible, but not necessarily present in the structure]

1.1.3 Modifying times
- Either the event time or the topic time may be modified by a \textit{for}- or an \textit{in}-adverb
- Modification of the speech time is excluded
  - Speech time is instantaneous and \textit{for}-adverbs require a time interval with non-atomic duration (Bennett and Partee 1972)
  - Speech time is deictic; deictic elements cannot be modified (Hornstein 1990)

1.2 Measuring time intervals
- Durative adverbs measure the duration of some time interval
- \textit{For}-adverb measures either the event time or the topic time
The equivalents of in-adverbs in Hungarian can measure either the event time or the topic time.

For- and In-adverbs cannot measure all intervals.

For-adverbs measure the duration of a time interval t, where the predicate P applying to t is divisible.

In-adverbs measure the duration of a time interval t, where the predicate P applying to t is non-divisible.

Divisibility
A predicate \( P \) is divisible iff whenever \( P(x) \) for an argument \( x \), then for all \( y \subset x \), \( P(y) \)

(Bennett and Partee 1972, Dowty 1979, Link 1998, a.o.)

For-adverbs

a. Fred slept for two hours
b. # Fred received a degree for two hours
c. for (two hours) (Fred sleep) (t)
d. \([[\text{for}]]) = \lambda T . \lambda P . \lambda t . (\forall t' \subset t . P(t'))

1.3 Eventualities

- Eventuality predicates
  - States (stative predicates)
  - Event predicates

(Bach 1986)
2 Durative adverb ambiguity

2.1 Ambiguity in in-adverb modification

- The two Hungarian equivalents of in-adverbs, alatt (‘under’) and belül (‘within’) adverbs measure a time interval t such that the predicate P applying to t is non-divisible
  - alatt adverbs measure the event time
  - belül adverbs measure the topic time

- When modifying an instantaneous event predicate (with an atomic event time),
  - alatt adverbs, which measure the event time, enforce a preparatory stage interpretation (resulting in a non-atomic event time)
  - belül adverbs, which measure the topic time, do not enforce such an interpretation (the adverb does not interfere with the event time)

(7) # Feri tíz perc alatt megbotlott
F-nom ten minute under slipped
‘Feri slipped in ten minutes’
(preparatory stage enforced)

(8) Feri tíz perven belül megbotlott
F-nom ten minute-in within slipped
‘Feri slipped (with)in ten minutes’

- The event time is a proper part of the topic time

(9) Let us assume an event time which lasts exactly an hour
[e.g. Feri started writing a letter at 4:00 and finished at exactly 5:00]

(10) Feri egy óra alatt írta egy levelet
F-nom one hour under wrote a letter
‘Feri wrote a letter in an hour’
(event time modification)

(11) # Feri egy órán belül írta egy levelet
F-nom one hour-on within wrote a letter
‘Feri wrote a letter (with)in an hour’
(measuring topic time, which properly contains the event time)

- English in-adverbs can measure either the event time or the topic time

(12) Fred slipped in ten minutes
(13) Fred wrote the letter in an hour
(from 4:00 to 5:00)

1The predicate applying to the event time must be non-divisible independently of the time interval measured
2.2 Ambiguity in for-adverb modification

(14) a. For a week, Fred was sick
    (event time modification)

b. For ten minutes, Fred didn’t cross the street
    (topic time modification)

c. For ten minutes, Fred was crossing the street
    (topic time modification)

- For-adverbs measure the duration of a time interval t, where the predicate P applying to t is divisible
- If the for-adverb measures the topic time, properties of the event time predicate are unaffected

3 Negation and for-adverb modification

3.1 Two accounts

3.1.1 Stativity hypothesis
- Negated event predicates are states
- Negation is a stativizer, an aspectual operator which converts all event descriptions into states

3.1.2 Measuring hypothesis

- Negated event predicates are not stative; properties of the event predicates are not affected by negation
- For-adverbs can be licensed by negation because negation yields a homogeneous predicate that meets the condition of for-adverb modification
- For-adverbs with negated event predicates can always measure the topic time

- Properties of states
  - Homogeneous (divisible; non-atomic)
  - Have inertia, continue on their own unless interrupted
    (characterized as lack of dynamicity, where dynamic eventualities need outside energy to continue)
    Comrie 1976, Smith 1991
• Non-derived states (e.g. Fred was sick) and derived states (progressives, e.g. Fred was running) are homogeneous and have inertia
• Negated event predicates are homogeneous but lack inertia (e.g. Fred didn't slip on the ice)
• Negated event predicates are not states

4 Against the stativity hypothesis

• Diverging behavior of states and negated event predicates
• Parallel behavior of non-derived (lexical) states and derived states (imperfective event predicates)
• For-adverb modification of non-divisible event predicates can also be licensed in absence of negation

4.1 States and negated event predicates

4.1.1 Discourse structure

• Stative predicates (including derived states) provide ‘background information’
• Event predicates yield consecutive ordering, advance narration
• Negated event predicates yield consecutive ordering
• Dowty 1986, Kamp and Reyle 1993, a.o.

(15) Affirmative predicates
  a. Melissa looked at Fred. He smiled  
     (event predicate; consecutive)
  b. Melissa looked at Fred. He was smiling  
     (stative; non-consecutive)
  c. Melissa looked at Fred. He was asleep  
     (stative; non-consecutive)

(16) Negated event predicates
  a. Melissa looked at Fred. He didn’t smile  
     (consecutive; the expected reaction didn’t happen)
  b. Melissa looked at Fred. He didn’t jump  
     (consecutive; the expected reaction didn’t happen)

(17) Negated stative predicates
  a. Melissa looked at Fred. He wasn’t smiling  
     (non-consecutive)
  b. Melissa looked at Fred. He wasn’t asleep  
     (non-consecutive)
4.1.2 Present tense interpretation

- States with present tense marking have an ongoing interpretation
- Event predicates with a present tense marking have a habitual interpretation
- Negated event predicates have a habitual interpretation

(18) States (no habitual interpretation enforced)
   a. Fred is sick
   b. Fred is reading a book

(19) Affirmative event predicates (habitual interpretation)
   a. Fred reads a book
   b. Fred runs along the railroad tracks

(20) Negated event predicates (habitual interpretation)
   a. Fred doesn’t read a book
   b. Fred doesn’t run along the railroad tracks

(21) Negated states (no habitual interpretation enforced)
   a. Fred isn’t sick
   b. Fred isn’t running along the railroad tracks

4.1.3 Agent arguments

- States lack agent arguments
- Agenthood diagnostics apply to all negated event predicates
- Agenthood diagnostics do not apply to states
  (some, but not all states can be coerced and receive an agentive interpretation)

(22) States
   a. # Fred was sick on purpose
   b. # Fred deliberately liked broccoli

(23) Non-agentive event predicates
   a. # Fred deliberately recognized his creditor

(24) Agentive event predicates
   a. Fred hit the car deliberately
   b. Fred pushed the glass off the table deliberately
• Agentive adverbs can take scope below or above negation
• A negated event predicate can be modified by an agentive adverb and a for-adverb at the same time
• A negated event predicate does not need to be stative (can have an agent argument) while is modified by a for-adverb

(25) \( \text{Neg} > \text{deliberately} \)
    a. Fred didn’t read the notice \textit{deliberately}
    b. # Fred \textit{deliberately} didn’t read the notice
    c. (he just saw it from the corner of his eye)

(26) deliberately > \( \text{Neg} \)
    a. # Fred didn’t read the notice \textit{deliberately}
    b. Fred \textit{deliberately} didn’t read the notice
    c. (he made sure that he didn’t)

(27) Negated event predicates modified by an agentive adverb and a for-adverb at the same time
    a. For a few minutes, Fred \textit{deliberately} didn’t recognize his creditor
    b. For a few minutes, Fred \textit{deliberately} didn’t notice the obvious mistake

4.2 \textit{For}-adverbs licensed elsewhere
• \textit{For}-adverbs can be licensed in absence of negation
• Other environments also involve an aspectual operator?

4.2.1 Downward entailing quantifiers
• DE quantifiers can create a divisible topic time predicate
• DE quantifiers can license for-adverb modification of all event predicates
• The for-adverb measures the topic time, not the event time

(28) Event predicates with downward entailing quantifiers
(The predicate applying to the event time is non-divisible)
    a. For two years, fewer than ten people received a degree in virology
       (the overall number of degree recipients was less than ten)
    b. For two hours, Fred found fewer than ten shells on the beach
       (the total sum of shells found was less than ten)
    c. For two weeks, Fred told the news to fewer than five people
       (Fred told the news to fewer than five different people)
Event predicates without downward entailing quantifiers (or negation)
(The predicate applying to the event time is non-divisible)

a. # For two years, (exactly) ten people received a degree in virology
b. # For two hours, Fred found (more than) ten shells on the beach
c. # For two weeks, Fred told the news to (more than) five people

4.2.2 Modification by only

- Only licenses for-adverb modification of all event predicates
- The for-adverb measures the topic time

Event predicates with only
(The predicate applying to the event time is non-divisible)

a. For two years, only five people climbed Mt Everest
b. For two years, only Fred received a degree in virology

Event predicates without only
(The predicate applying to the event time is non-divisible)

a. # For two years, (exactly) five people climbed Mt Everest
b. # For two years, Fred received a degree in virology

A revision of required properties of the predicate of times
- Only does not yield a divisible predicate of times

For two years, only Fred received a degree in virology

John received a degree in virology on August 30, 2001
Fred received a degree in virology on August 30, 2001
Peter received a degree in virology on August 31, 2003

For two years (between August 31, 2001 and August 30, 2003)
only Fred received a degree in virology
(t is the time interval between August 30, 2001 and August 30, 2003)

For some subintervals \( t' \subset t \), such as the time span between March 30, 2003
and August 30, 2003, it is not true that Only Fred received a degree in virology at \( t' \)

Solution: Strawson divisibility

Strawson divisibility is defined based on Strawson entailment (von Fintel 1999)

Strawson divisibility
A predicate \( P \) of times is Strawson divisible iff whenever \( P(t) \) for an interval \( t \),
then for all \( t' \subseteq t \), such that \( P \) is defined at \( t' \), \( \exists t'' [t' \subseteq t'' \subset t \& P(t'')] \)

- Only licenses Strawson divisibility
- For-adverb modification by only is predicted if for-adverbs require Strawson divisibility
5 Durative adverb modification and an exception

- Durative adverbs impose divisibility restriction on the predicate of times modified
- Durative adverbs are flexible; they can measure either the event time or the topic time (certain adverbs may be restricted to measuring only one type of time interval)
- Durative for-adverb modification licensed by negation is not due to stativization, but to the divisibility of the predicate applying to the topic time

5.1 An exception
- Structurally case marked equivalents of for-adverbs can measure only the event time, but not the topic time

5.2 Hungarian
- The PP and structurally case marked equivalents of for-adverbs pattern identically with respect to event time modification, but differ with respect to topic time modification

(37) For-adverbs
  a. két órát
two hour-acc
   ‘for two hours’ (structurally case marked adverb)
  b. két óráig
two hour-until
   ‘for two hours’ (PP adverb)

(38) Affirmative event predicates
  a. Feri két órát / két óráig futott
     F-nom two hour-acc / two hour-until ran
     ‘Feri ran for two hours’
  b. # Feri két órát / két óráig meg érkezett
     F-nom two hour-acc / two hour-until perf arrived
     ‘Feri arrived for two hours’

(39) Negated event predicates
     (The predicate applying to the event time is non-divisible)
  a. # Feri két órát nem érkezett meg
     F-nom two hour-acc not arrived perf
     ‘Feri didn’t arrive for two hours’
  b. Feri két óráig nem érkezett meg
     F-nom two hour-until not arrived perf
     ‘Feri didn’t arrive for two hours’
5.3 The source of the restriction

- Locality restrictions
  - Structural case licensing is local
    Accusative case must be licensed in a position local to the case licensor v
  - Adverbial modification is local
    Adverbs can only measure a time interval that is local to the position where the adverb is merged (cf. Thompson 1996)

- An accusative adverb can only measure the event time, the time interval associated with the v head
- The restriction of accusative adverbs to event time modification is independent of the denotation of the adverb
- It is possible to maintain a universal definition of for-adverbs, independently of their structural / morphological properties

5.4 Structurally case marked adverbs elsewhere

5.4.1 Finnish

(40) # Kynnemen minuttia hän ei tunnistanut presidenttiä
ten-part minute-part he-nom not recognized president-part
‘For ten minutes, he didn’t recognize the president’
(Negated event predicate modified by a structurally case marked adverb)

(41) Kynnmenen minuuttoin hän ei tunnistanut presidenttiä
ten-ill minute-ill he not recognized president-part
‘For ten minutes, he didn’t recognize the president’
(Negated event predicate modified by a PP adverb)

5.4.2 Korean

(42) # Sip-pwun-ul, ku-nun taythonglyeng-ul alapo-ci-mos-hay-ss-ta
ten-minute-acc he-top president-acc recognize-cl-not-do-past-dec
‘For ten minutes, he didn’t recognize the president’
(Negated event predicate modified by structurally case marked adverb)

(43) Sip-pwun tongan, ku-nun taythonglyeng-ul alapo-ci-mos-hay-ss-ta
ten-minute for he-top president-acc recognize-cl-not-do-past-dec
‘For ten minutes, he didn’t recognize the president’
(Negated event predicate modified by PP adverb)

- A puzzle

(44) ? Sip-pwun-tongan-ul, ku-nun taythonglyeng-ul alapo-ci-mos-hay-ss-ta
ten-minute-for-acc he-top president-acc recognize-cl-not-do-past-dec
‘For ten minutes, he didn’t recognize the president’
(Negated event predicate modified by an accusative PP adverb)
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