Building temporal structure: Adverbs and times

Aniko Csirmaz

University of Utah

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1 Introduction

2 Time intervals

3 Counting adverbs

4 Adverb iteration and ordering
Basic questions

- Time intervals in a clause
- Times and counting adverbs (multiplicatives, frequency adverbs and adverbs of quantification)
Claims

- Articulated structure of times in a clause
- Distinction among counting adverbs
- Sources of iterative interpretation
- Iteration of adverbs and times
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Times in a finite clause

- Event time
  (Runtime of the eventuality)
- Topic / reference time
  (Time under discussion (Reichenbach 1947, Klein 1994, a.o.))
- Speech time
  (Time of utterance)
Possible times

- Result time
  (Time interval during which result state holds)

- Iterative time
  (Time during which iteration (of a type of eventuality) occurs)

- Habitual time
  (Time during which a type of eventuality habitually obtains)

- Perfect time
  (Time interval between times determined by tense (right boundary) and determined by an argument of an adverb (Iatridou et al. 2001, a.o.))

- Modal time
  (Time during which modal evaluation obtains (Zagona 1990, Stowell 2004))
Building temporal structure

- Time intervals
- Positions

Times

(1)
... speech time
  modal time
    perfect time
      topic time
        habitual time
          iterative time
            event time
              result time
                ...

...
Introducing a time interval

- Speech time: T head
- Topic time: Asp head
  (determining (im)perfective aspect; ordering of event and topic time)
- Event time: verbal predicate
- Modal time: Mod head
- Perfect time: Perfect head
- Habitual time: HAB operator
- Iterative time: ITER operator
- Result time: predicate of result subevent
Properties of predicates of times

- Homogeneity and durativity can be determined for any predicate of times
- (Telicity, boundedness)
For-adverbs and homogeneity

(2)   a. Speech time (deictic, no modification)
      b. Zed could have escaped for two hours (modal time)
      c. Zed has lived here for fifty years (perfect time)
      d. Zed was writing that letter for half an hour (topic time)
      e. Zed drank for fifty years (habitual time)
      f. Zed coughed for ten minutes (iterative time)
      g. Zed wrote for two hours (event time)
      h. Zed opened the window for an hour (result time)
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Distinction among counting adverbs

- Multiplicatives
- Frequency adverbs
- Adverbs of quantification
Multiplicatives

- *twice, five times, many times*
- Cardinality of situations
- Introduce iterative time
- Introduce iteration (not: multiplicative [ ITER ])}
Building temporal structure

Counting adverbs

Multiplicatives

Examples

(3) a. Zed nodded / winked
    [once / *multiple times; no ITER]
b. Zed nodded twice

(4) Hungarian

a. Zed ból-int-ott
   Z-nom nod-semelfactive-past,3sg
   ‘Zed nodded once / *multiple times’
   [Semelfactive suffix -int; no ITER]
b. Zed kétszer / többször ból-int-ott
   Z-nom twice / several times nod-sem-past,3sg
   ‘Zed nodded twice’
Frequency adverbs

- frequently, rarely
- Frequency of situations in a given time interval
- Require a time interval argument
- Variable behavior with respect to iteration
  - Iteration introduced in English
  - No iteration in Hungarian
Building temporal structure

Counting adverbs

Frequency adverbs

Examples

(5) Zed nodded / winked frequently
   a. Zed nodded frequently in agreement as Fred lectured
   b. He nodded frequently and his face seemed contemplative
   c. He looked in their direction and winked frequently

(6) Hungarian
   a. ?? Zed sűrűn ból-int-ott
      Z-nom frequently nod-sem-past,3sg
      ‘Zed frequently nodded’ (no iteration)
   b. Zed sűrűn ból-ogat-ott
      Z-nom frequently nod-iter-past,3sg
      ‘Zed frequently nodded’ (iterative suffix)
Adverbs of quantification

- *often, always, sometimes*
- Quantify over situations
- Restrictor: a time interval
- Iteration introduced (quantification over multiple situations)

Proportional readings (cf. Swart 1993, a.o.) are ignored here. An interpretation of *Zed often drank mango juice* not considered is one where it is the proportion of situations of Zed drinking and of Zed drinking mango juice that is specified. The interpretations discussed are those that Swart 1993 refers to as ‘pure frequency’ readings.
Examples

(7) Zed often nodded / winked (when ...)
(8) Hungarian
    Zed    gyakran ból-int-ott
    Z-nom often    nod-sem-past,3sg

‘Zed often nodded’

Strict distinction between the two types of adverbs, specific criteria (esp. Jóhannsdóttir 2005)

Frequency adverbs
- Affect event time
- Can affect homogeneity (diagnosed by for-adverbs)
- Are pluractional operators

Adverbs of quantification
- Affect the topic time
- Cannot affect homogeneity
Previous approaches

(9) Frequency adverbs (in the scope of a *for*-adverb)
   a. John was constantly discovering fleas on his dog for a whole month
   b. Joe discovered a flea on his dog every now and then for a month

(10) Adverbs of quantification (cannot be in the scope of a *for*-adverb)
   a. * John was often finding fleas on his dog for a whole month
   b. * Mary always / usually discovered a flea on her dog for a month
Challenging the view

- Frequency adverbs
  - Do not always affect the event time directly
  - Affect homogeneity (yield a homogeneous predicate)
  - Are not necessarily pluractional operators; they can require multiple, iterated events

- Adverbs of quantification
  - Do not affect the topic time
  - Can affect homogeneity (yield a homogeneous predicate)
Pluractional operators?

- Frequency adverbs are not pluractional operators
  - They can yield pure iteration, with the same participants
  - They cannot always yield iterated interpretation (semelfactive verbs in Hungarian)
  - They cannot modify unique, once-only descriptions (only an iterated interpretation is possible)
Pluractional operators?

(11) Jim hit a golf ball into the lake for an hour
    (same golf ball; ≠ different golf balls)

(12) Jim hit a golf ball into the lake every five minutes for an hour
    (same golf ball; different golf balls)
    (Van Geenhoven 2004, 2005)

(13) Jim hit a golf ball frequently into the lake for an hour
    (same golf ball; ≠ different golf balls)
Homogeneous predicates

(14) Frequency adverbs
   a. Zed coughed frequently for an hour
   b. For an hour, Zed coughed frequently

(15) Adverbs of quantification
   a. * Mary always / usually discovered a flea on her dog for a month
   b. For a (whole) month, Mary often / always discovered a flea on her dog (when she checked)
Homogeneous predicates

- Compare topic time modification (with flexible durative orders) and *for*-modification of a non-homogeneous predicate

(16) **Topic time**
- a. (%) Zed didn’t arrive for two hours
- b. (%) For two hours, Zed didn’t arrive

(17) **Non-homogeneous predicate**
- a. * Zed finished the picture for two hours
- b. * For two hours, Zed finished the picture
Times affected

(18) Frequency adverbs
   a. Zed frequently arrived late (event time)
   b. Zed frequently knocked twice (iterative time)

(19) Adverbs of quantification
   a. Zed often arrived late (event time)
   b. Zed often knocked twice (iterative time)
   c. Zed always spoke frequently (in class) (iterative time)
Counting adverbs

- Multiplicatives
  - Cardinality
  - Can introduce iteration
- Frequency adverbs
  - Frequency with respect to some time interval
  - Variable behavior with respect to iteration
- Adverbs of quantification
  - Quantify over situations
  - Introduces iteration, possibly with distinct participants
No adverbs

- Unique time intervals
  - Speech time (T head)
  - Topic time (Asp head)
  - Event time (verb)
  - Modal time (Mod)
  - Perfect time (Perf)
  - Result time (result predicate)

- Introduced by a head or predicate; no iteration
No adverbs

Iterable time intervals?
- ITER, HAB
- Empty operators cannot be iterated (recoverability?)
No adverbs

(20) Zed jumped
   a. once
   b. multiple times (ITER)
   c. habitually (HAB)
   d. *repeatedly, each time multiple times (ITER (ITER))
Adverbs

- Iteration possible with counting adverbs
  - Multiple adverbs, multiple times
  - Restriction on iteration: coercion
    Countability (non-homogeneity) is required by counting adverbs; complex structure containing an adverb may be homogeneous (e.g. *Zed was often late*)
Adverbs

(21) Multiplicative
Zed knocked [twice] [three times] on my door

(22) Frequency adverb
Zed [frequently] wrote to his cousin [regularly]

(23) Adverb of quantification
The modem light [usually] [always] flickers
Time introduced by an adverb

Time interval introduced

- Multiplicatives: iterative
- Frequency adverbs: iterative or habitual
- Adverbs of quantification: iterative or habitual
Iterative time

(24) Frequency adverb and adverb of quantification
    Zed frequently / often coughed yesterday

(25) Multiplicative
    Zed coughed twice yesterday
Habitual time

(26) Adverb of quantification
Zed often ate a sandwich around four

(27) Frequency adverb
Zed frequently drank mango juice
(a custom; habitually recurs during a (long) time span)

(28) Multiplicative
Zed drank mango juice twice
(not a custom; cannot recur habitually)

‘Frequency’ of drinking mango juice can be fairly low, but high compared to a contextually determined standard (with ‘frequently’ being false within a smaller time interval, with possibly no occurrences)
Limited iteration

No iteration

- Motivates distinction between frequency adverbs and adverbs of quantification in terms of times
- Frequency adverbs and adverbs of quantification can cooccur because they affect distinct time intervals (event time vs. topic time)

At most two adverbs of each type

- Cinque 1999
Order and scope

- With iterated adverbs, the interpretation follows from scope relations

(29) Zed often always drinks mango juice
    (There is a period $t$ during which there are many subintervals $t'$ of $t$ such that at all (relevant) subintervals of $t'$ there is a situation of Zed drinking mango juice)

(30) Zed always drinks mango juice often
    (There is a period $t$ such that at all (relevant) subintervals $t'$ of $t$ there are many situations of Zed drinking mango juice)
Variation in ordering

- Adverb ordering can vary crosslinguistically
  - Availability of coercion operators (yielding non-homogeneous predicates)
  - Constraints on scope and syntactic / linear position
- Adverb ordering postverbally: independent variation
  - English: inverse scope
  - Hungarian: either surface or inverse scope postverbally (free ordering)
    (cf. Csirmaz (submitted), É. Kiss (submitted))
Variation in ordering

(31)  
   a.  Take one capsule *twice daily*
   b.  ?? Take one capsule *daily twice*

(32)  
   a.  EGY KAPSZULÁT kell be venni *naponta kétszer*
       one capsule-acc must in take-inf daily twice
       ‘It is a capsule that must be taken twice daily’ (daily>2)
   b.  EGY KAPSZULÁT kell be venni *kétszer naponta*
       one capsule-acc must in take-inf twice daily
       ‘It is a capsule that must be taken twice daily’ (daily>2)
Variation in ordering

- Times introduced by the adverb
- Position of times
- Independent, general considerations of ordering and scope
Times and adverbs

- **Times**
  - Time intervals in a clause
  - Position, source, homogeneity of times

- **Counting adverbs**
  - Three-way distinction among counting adverbs
  - Possible iteration of adverbs
  - Times introduced by adverbs
References

- Csirmaz, A. (submitted). Multiplicatives, frequency and quantification adverbs: Flexibility and rigidity. in K. É. Kiss (ed) *Adverbs and adverbial modifiers at the interfaces*
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References
