Times and durative adverb modification
Aniko Csirmaz, Carleton College (acsirmaz@carleton.edu)
Problem. Durative adverbs, such as *for*-adverbs, can measure the time of an atelic event predicate (1a). They can also modify a negated event predicate even if its affirmative counterpart is telic (1b):

(1)a   Fred slept for ten minutes
    b   For ten minutes Fred didn't cross the street // #Fred crossed the street for ten minutes

Durative adverbs must allow both atelic and negated event predicates to be modified, irrespective of the telicity of the latter. I show that this can be accomplished by a unique adverbial denotation, which also accounts for a new set of cases.

Previous approaches. Two types of accounts were proposed to date. According to the **stativity hypothesis** (Bennett and Partee 1972, Dowty 1979, Verkuyl 1993, a.o.), negation yields states from all event predicates which, like other states, can be modified by durative adverbs. Moltmann 1991, Zucchi 1991 and Kamp and Reyle 1993 argue that negation fails to stativize. Rather, the durative adverb can measure a **time interval** if there is no event of the appropriate kind within that interval. I argue for the second position, showing that negated event predicates lack stativity. I also present data which are handled only by the second approach. Finally, I offer a specific implementation of the adverb interpretation.

Solution. I propose a unique treatment of durative adverbs which derives both atelic and negated event predicate modification. Following Hinrichs 1985 and von Fintel 1997, I assume that the arguments of the durative **for** are a measure phrase (**T**), a predicate of times (**P**) and a time interval (**t**). **P** must be divisible, defined by Hinrichs 1985 (adapted by Fintel 197) as shown below.

(2) $[[for]] = \lambda T . \lambda P . \lambda t . [\forall t' \subset t [\exists t'' [t' \subseteq t'' \subset t \& P(t'')]]] \& |t| = T$

Given a Reichenbachian system (specifically Iatridou et al. 2001 and Stechow 2002), (2) allows **t** to be either the event time or the topic time, if **P** is divisible as in (2). Speech time is excluded because it is instantaneous (Bennett and Partee 1972) and because deictic elements cannot be modified (Hornstein 1990). Negation yields a divisible topic time: if the topic time does not contain a certain kind of event, neither will its subintervals. The topic time of a negated event predicate can thus serve as **t** in (2).

Predictions. Topic time modification is predicted to be possible whenever **P** is divisible. Apart from negation, downward entailing quantifiers also yield a divisible predicate of times, which can thus serve as the argument of durative adverbs.

(3)a   For two years fewer than ten people received a degree in virology
    b # For two years (more than) ten people received a degree in virology

The topic time **t** in (3a) is a time interval which contains an event time of fewer than ten people receiving a degree in virology. In this case it is true for all subintervals **t'** of **t** that they are contained in a proper subinterval **t''** of **t** such that fewer than ten people received a degree in virology in **t''**. **Only** also permits durative adverb modification of the topic time:

(4)   For two years #(only) five people / #(only) Fred received a degree in virology

Only can be assimilated to the previous cases if a modification is adopted. Since **only** does not license a divisible predicate of times, it must be ensured that it nevertheless yields an appropriate predicate of times. To derive modification, I extend **Strawson entailment** (von Fintel 1999) to **Strawson divisibility**:

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

Strawson divisibility is relevant for only subintervals where the predicate is defined, in spite of existing subintervals where the predicate does not hold. If durative adverbs require **P** to be Strawson divisible, then adverb modification is straightforwardly derived. The proposed treatment of durative adverbs handles DE quantifiers and **only** successfully, while the stativity hypothesis does not extend to these.

An apparent exception. Structurally case marked durative adverbs are restricted to modifying the event time, as the following Korean example illustrates.

(6)   *Sip-pwun   tongan / # sip-pwun-ul,*   ku-nun   taythonglyeng-ul alapo-ci-mos-hay-ss-ta
        ten-minute for   ten-minute-acc he-top   president-acc   recognize-cl-not-do-past-dec
        'For ten minutes he didn't recognize the president' [PP / accusative durative adverb]

I argue that no special treatment is needed for structurally case marked adverbs. The restriction to event time modification follows from locality constraints on adverbial modification and case licensing. The independent locality constraint supports the proposed approach to durative adverb modification.

References

Bennett, M. and B. Partee 1972. Toward the logic of tense and aspect in English. System Development Corporation, Santa Monica, Calif. Reprinted in Partee, B. *Compositionality in Formal Semantics*. 2004. Oxford: Blackwell

Dowty, D. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Kluwer

von Fintel, K. 1997. Aspectual classes and aspectual composition. handout, MIT

von Fintel, K. 1999. NPI licensing, Strawson-entailment, and context-dependency. *Journal of Semantics* 16

Hinrichs, E. 1985. A compositional semantics for Aktionsarten and NP reference in English. PhD dissertation, Ohio University

Hornstein, N. 1990. *As Time Goes By: Tense and Universal Grammar*. Cambridge, MA: Bradford Books and MIT Press

Iatridou, S., E. Anagnostopoulou and R. Izvorski. 2001. Observations about the form and meaning of the perfect. in M. Kenstowicz (ed) *Ken Hale: A Life in Language*. Cambridge, MA: MIT Press. Reprinted in A. Alexiadou, M. Rathert and A. von Stechow (eds) *Perfect Explorations*. 2003. Berlin: Mouton de Gruyter

Kamp, H. and U. Reyle 1993. *From Discourse to Logic*. Dordrecht: Kluwer

Moltmann, F. 1991. Measure adverbials. *Linguistics and Philosophy* 14

Stechow, A. von. 2002. Temporal prepositional phrases with quantifiers: some additions to Pratt and Francez. ms, Univesitat Tubingen

Verkuyl, H. 1993. *A Theory of Aspectuality*. Cambridge: Cambridge University Press

Zucchi, S. 1991. Negation and aspect. in B. Ao, G. Westphal and H.-R. Chae (eds) *Proceedings of ESCOL 8*. Ithaca, NY: CLC Publications