

Measuring times

Problem. Durative adverbs, such as *for*-adverbs, can measure the time of an atelic event predicate (EP) (1a), and also that of a negated EP, even if the affirmative EP is telic (1b):

(1)a Fred ran for ten minutes

b For ten minutes Fred didn't cross the street // #For ten minutes Fred crossed the street

It must be ensured then that durative adverbs can modify both atelic and negated EPs, irrespective of the telicity of the latter.

Previous approaches. Two types of accounts were proposed for negated EP modification. The **stativity hypothesis** (Bennett and Partee 1972, Dowty 1979, Verkuyl 1993, a.o.) assumes that negation converts all EPs into states. These, like other states, can be modified by durative adverbs. In contrast, Moltmann 1991, Zucchi 1991 and Kamp and Reyle 1993 argue that negation fails to stativize. Rather, a 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 EPs lack stativity. I also present data that are handled only by the second approach and offer a specific implementation of adverb interpretation.

Solution. I propose a unique treatment of durative adverbs that derives both atelic and negated EP modification. Following Hinrichs 1985 and von Stechow 1997, I assume that the arguments of **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 1997) as in (2).

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

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

Predictions. Topic time modification is predicted to be possible whenever **P** is divisible. Apart from negation, DE quantifiers also yield a divisible predicate of times:

(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. It is true then 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 does not license a divisible predicate of times; there can be subintervals when no one received a degree. To derive adverb modification and assimilate **only** to the previous cases, I extend **Strawson entailment** (von Stechow 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, allowing subintervals where the predicate does not hold. If durative adverbs require **P** to be Strawson divisible, then modification is straightforwardly derived. The treatment proposed above, in contrast with the stativity hypothesis, handles DE quantifiers and **only** successfully.

An apparent exception. Structurally case marked durative adverbs are restricted to modifying the event time and cannot modify topic time, as shown by the Korean example (6).

(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 these adverbs. The restriction follows from independent locality constraints on adverbial modification and case licensing.

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 Stechow, A. 1997. Aspectual classes and aspectual composition. handout, MIT
- von Stechow, A. 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