Events in space

Amy Rose Deal, UMass Amherst

Temporal relations occupy a privileged place in semantic theorizing in reflection of their special status in natural languages; "relations of date are exalted grammatically as relations of position, weight and color are not" (Quine 1960: 170). Semanticists have responded to the challenge of explaining tense marking by assigning times a special semantic status via a designated parameter of evaluation (Prior 1967, Montague 1973) or via designated temporal variables (van Bentham 1977, Kusumoto 2005). This special treatment of time seems necessary in light of the apparent priority of temporal relations (e.g. over spatial ones) in many familiar languages.

The present paper focuses on a challenge to the claim that temporal relations are always "exalted grammatically" over spatial relations – a challenge to the claim that natural language semantics requires special machinery specific to tense. Instead, I argue for a semantics based on situations, parts of worlds of which both temporal and spatial coordinates may be predicated. The evidence comes from Nez Perce (Penutian), a language whose verbal inflectional morphology registers not just aspect and tense but also a marking of spatial location. The CISLOCATIVE suffix *-m(e)* marks proximity between the topic location and the speech location; the TRANSLOCATIVE suffix *-k(i)* marks distance. (All examples in this paper were elicited in north central Idaho and have their spatial coordinates resolved accordingly.)

(1) kine hi-weqi-me
here 3SUBJ-rain-CIS
It rained here.

(2) hi-weqi-ki waykiki
3SUBJ-rain-TRANS Waikiki.HI
It rained in Waikiki.

These markers are squarely a part of the tense-aspect system, as evidenced by their morphological position between viewpoint aspect and tense (3), as well as a number of cooccurence restrictions between space markers and tense and aspect markers (e.g., the habitual aspect marks only cislocative in present and remote past tenses, and disallows space markers entirely in the recent past tense).

(3) hi-waqi-**sa-m-qa** lepwei kex kaa iin weke tatxinma
3SUBJ-rain-**IMPERF-CIS-RECENT.PST** Lapwai.ID when.1SG I was Moscow.ID
It was raining here in Lapwai when I was in Moscow

Space markers are optional in Nez Perce:

(4) hi-waqi-**sa-qa** lepwei / waykiki
3SUBJ-rain-IMPERF-RECENT.PST Lapwai.ID / Waikiki
It was raining in Lapwai (near) / Waikiki (far)

The space markers have several properties reminiscent of diagnostics for tense. They are closed-class, inflectional morphemes with a basic meaning of locating events in space (cf. on tense: Comrie 1985, Shaer 2003). They appear immediately following aspectual markers – a position thought to be reserved for tense itself (Cinque 1999, Hacquard 2006). They are optional, but this is attested in tense systems such as that of Navajo, where future and past particles are similarly optional (Smith, Perkins and Fernald 2003). The two space markers also seem to encode the same distinction in Nez Perce as the two tense markers, *qa* recent past and *ne* remote past; cislocative and recent past mark nearby space and time, respectively, whereas translocative and remote past mark more distant space/time.

Such formal and morphological similarities between tenses and space markers raise the question of whether the two ought to be accorded an equal status. Of course, the potential addition of "spatial tenses" to the theory, along with supporting machinery, threatens to require widespread revisions of quite well-supported mechanisms and devices for dealing with verb meanings, tense and (viewpoint) aspect. In particular, the position of space markers between tense and aspect raises issues for theories of tense and aspect inspired by Klein (1994), according to which aspect relates event time to topic time, and tense relates topic time to utterance time. (Thus in Klein's example *A book was on the table. It was in Russian.*, the past tense in the second sentence means not that the time of the book's being in Russian is prior to the utterance time, but that the topic time of the narrative is prior to the utterance time.) In the formalization given by Kratzer (1998), aspect heads denote functions from properties of events (VPs) to properties of times, which are then input to tense heads. The appearance of space markers between aspect and tense is quite unexpected on such a view. Space appears to be interloping in the region of the tree reserved for calculations of time.

Two main ways of amending the Kleinian view to allow for space markers suggest themselves. The first is to posit cross-linguistic variation in the semantics of viewpoint aspect. For English and similar languages, we can preserve Klein's analysis of aspect as relating the event time to a topic time. But aspect is different in Nez Perce: it relates VP events to topic spaces, not times. In cases where Nez Perce lacks a space marker, such as (4), we can say that a null, underspecified space marker is present; or we can say that Nez Perce also contains an English-style version of its aspect head which maps directly to topic times when a space marker is not present.

(5) Imperfective viewpoint aspect in English (Kratzer 1998, after Klein 1994):
$\lambda P_{<l,st>} \lambda t_i \lambda w_s \exists e_l [t \subseteq time(e)\ \&\ P(e)(w)]$

(6) Potential denotation for imperfective viewpoint aspect in Nez Perce (3), Variation Hypothesis:
$\lambda P_{<l,st>} \lambda r_{space} \lambda w_s \exists e_l [r \subseteq space(e)\ \&\ P(e)(w)]$

This approach has empirical and theoretical shortcomings. First, it posits that aspect in Nez Perce (3) deals only with space; it concerns the relation between a topic space and a event space. Thus imperfective in (3) would mean that the topic space is part of the raining space. This is incorrect; Nez Perce viewpoint aspect, like its English counterpart, seems able to deal with temporal relations. Furthermore, the above proposal would seem to require space marker denotations to output propositions in cases like (1-2), where no tense is marked, but also properties of times for manipulation by tense in cases like (3), where both space and time are marked. Thus both aspect markers and space markers must be assigned multiple denotations in order to account for the possibility of omitting space and/or tense markers in Nez Perce.

An alternative approach within the same family of theories is to back away from Klein's claim that aspect marks a relation between event *time* and topic *time*. Adopting instead a semantics based on SITUATIONS, regions of spacetime that are parts of possible worlds (Kratzer 2007), I argue that aspect locates an event within a topic *situation*. Thus tense is a situation modifier: it predicates of the topic situation a prior-to-utterance temporal location. Space markers, likewise, serve to locate the topic situation with respect to the utterance. Recent past tense and cislocative are analyzed as in (7-8), where s_0 is the utterance situation. (For (7) I assume that in the absence of a modal, only present and past times can be referred to.)

(7) Recent past: $\lambda p \lambda s.p(s)$ & s is temporally proximal to s_0

(8) Cislocative: $\lambda p \lambda s.p(s)$ & s is spatially proximal to s_0

This analysis does not require cross-linguistic or language-internal variation in the semantics of aspect or space markers. What it does require is the ontological category of situations – a category whose postulation has independently proven fruitful in the semantics of perception reports (Barwise 1981), quantifier domain restriction (Barwise and Perry 1983), donkey anaphora (Berman 1987) and exhaustive interpretations (Kratzer 2007).

The situation-based Kleinian semantics allows us to make a number of correct predictions about space markers, tenses and their interaction in Nez Perce. Since both tense and space markers are treated as <st,st> situation modifiers, we correctly predict that they may cooccur, as shown in (3). We also correctly predict that either may be absent. We have seen the absence of space markers in (4), as well as the absence of tense markers in (1-2); these latter examples are perfects, and tense in the Nez Perce perfect is supplied only contextually (Rude 1985). We can also begin to understand languages that permit only one situation modifier per clause, *either* tense or space marking, as seems to be the case in Sanuma (Borgman 1990), as well as languages that may be tenseless and "spaceless", lacking spatiotemporal situation modifiers altogether, as perhaps is the case in West Greenlandic (Shaer 2003). The situation modifier approach is thus a promising way forward for a semantic theory charged with capturing the space marking systems of languages like Nez Perce while retaining previous results gleaned from spatially impoverished languages.

References

Barwise, J. 1981. Scenes and other situations. JP 78: 369-97. • Barwise, J. and J. Perry. 1983. *Situations and attitudes*. MIT Press. • Bentham, J.F.A.K. van. 1977. Tense logic and standard logic. *Logique et Analyse* 20, 395-437. • Berman, S. 1987. Situation-based semantics for adverbs of quantification. *UMOP 12*. GLSA. • Borgman, D. 1990. Sanuma. *Handbook of Amazonian Languages* vol 2. Mouton. • Cinque, G. 1999. *Adverbs and functional heads.* Oxford. • Comrie, B. 1985. *Tense*. Cambridge. • Hacquard, V. 2006. *Aspects of modality*. Dissertation, MIT. • Klein, W. 1994. *Time in language*. Routledge. • Kratzer, A. 1998. More structural analogies between pronouns and tenses. SALT VIII. • Kratzer, A. 2007. Situations in natural language semantics. Stanford Encyclopedia of Philosophy. • Kusumoto, K. 2005. On the quantification over times in natural language. NLS 13: 317-357. • Montague, R. 1973. The proper treatment of quantification in ordinary English. • Prior, A. 1967. *Past, present and future*. Clarendon. • Quine, WVO. 1960. *Word and object*. MIT Press. • Rude, N. 1985. Studies in Nez Perce grammar and discourse. Dissertation, UOregon. • Shaer, B. 2003. Towards the tenseless analysis of a tenseless language. *SULA 2*. GLSA. • Smith, C., E. Perkins and T. Fernald. 2003. Temporal interpretation in Navajo. *SULA 2*. GLSA.