First African Summer School in Linguistics
Syntax-semantics Interface and Cross-Linguistic Variation: Session VII
Malte Zimmermann

Session VII – Event Semantics

1. Questions and Observations

- *Questions:*

i. What is the reference of abstract nouns such as *destruction*, *incident, event* ?

ii. What is the meaning of vP-adjuncts such as *in Rome*, *in the afternoon* etc.?

iii. What is the quantificational domain of Q-adverbs such as *always, often, mostly* etc.?

- *Observations:*

i. The referential potential of natural language expressions is not exhausted by entites (<e>) and truth values (<t>) and functions built from these basic types.

ii. Natural language expressions can make reference to ***events*** or ***situations***:

- direct reference to events, e.g. event nominalizations; (1a):
- quantification over events, (1bc)
- anaphoric pronominal reference across sentence boundaries, (1d)

(1) a. the **fall** of the Berlin Wall

b. Germany beat France **twice**.

c. **Always** when Germany wins the World Cup people celebrate in the street.

d. **the German win** in the finals came as a big surprise. Nobody had expected **it**.

2. Events/ situations in the semantic of natural language

- With an utterance of a sentence we refer simultaneously to a particular event and to a class of events of a particular type (Davidson 1967):

(2) Brutus kissed Caesar

i. Episodic sentences such as (2) can refer to different eventualities depending on place and time of utterance; see (3):

(3) **Brutus kissed Caesar** on Monday and **Brutus kissed Caesar** on Tuesday.

ii. The concrete utterance of an episodic sentence always relates to a particular event (or situation/eventuality), but the semantic content of the clause specifies a set of events (= an event type) that can be referred to by the sentence.

- The assumption of events as referent of natural language expressions allows for a simple interpretation of vP-adjuncts (lokative, temporal, instrumental), such as in (4), in terms of predicate modification (Davidson 1967):

(4) Brutus killed Caesar [with the knife][in Rome][on the Ides of March]

→ vP-adjuncts do NOT denote sets of concrete individuals.

(5) since Caesar [$_{vP}$ died [$_{vP}$ on Wednesday]]

a. [[died]] = $\lambda x \in D_e$. x died

b. INCORREKT: [[on Wednesday]] = $\boldsymbol{\lambda x \in D_e}$**. x** war on Wednesday

c. INCORREKT: [[died on Wednesday]] = $\lambda x \in D_e$. x was on Wednesday and x died

d. INCORREKT: [[Caesar died on Wednesday]] = 1 iff Caesar was on Wednesday and Caesar died.

Q:	What does the temporal adjunct in (5) predicate over?
A:	**The temporal adjunct helps in loacalizing an event in time!**

(5') [[Caesar died on Wednesday]]

= 1 iff there was an event of Caesar dying that took place on Wednesday

(5'') $\exists e$ [$t(e) < t_0 \wedge$ die'(Caesar, e) $\wedge$ on'(e, Wednesday')]

Q:	How to determine the sentence meaning compositionally ?

3. Ontological and semantic status of events

- *Ontological status (Reichenbach 1947, Davidson 1967, Parsons 1990, Link 1998, Eckardt 2002):*

i. Events (or: situations) are primitive ontological categories that can be referred to by natrual language expressions.

ii. Events/Situations are a special kind of entity that are temporally less stable and of a more transient nature than individual entities

iii. Events/Situations can be characterized/identified by time and place of their occurrence: they have spatio-temporal properties

(6) a. the [meeting on Monday] was successful

{e: e was a meeting and e was on Monday}

b. *?Peter on Monday was successful

- *The semantic status of events/situations (Davidson 1967):*

i. Events are fed into the semantic represenation by the lexical meaning of (verbal) predicates, which introduce an event argument next to their 'normal' individual arguments.

ii. For convenience, the event argument is given ist own semantic type: <v>.

→ intransitive verbs denote 2place functions from individuals into functions from events into truth values (= relations between individuals and events).

(7) [[die]] = $\lambda x \in D_e$. $\boldsymbol{\lambda e \in D_v}$. x dies in e

→ transitive verbs denote 3place functions (= ternary relations) and take two individuals and one event as arguments:

(8) [[kiss]] = $\lambda x \in D_e$. $\lambda y \in D_e$. $\boldsymbol{\lambda e \in D_v}$. y kisses x in e

iii. The meaning that results from applying the verb meaning with its one or more individual arguments (= meaning of vP) is a set of events characterizing an event type.

(9) a. [[Caesar died]] = $\lambda e \in D_v$. Caesar died in e

b. [[Brutus kisses Caesar]] = $\lambda e \in D_v$. Brutus kisses Caesar in e

→ Such event types can be predicated of different events at different times of utterance.

- *Modification with vP-adjuncts:*

  The expressions in (9ab), which denote sets of entities, can be further restricted by other expressions denoting sets of events by means of the compositional procedure of PREDICATE MODIFICATION

→ This allows for correctly deriving the semantic meaning of (5) in (5'') (*ignoring tense*)

(10) a. [[Caesar died]] = $\lambda e \in D_v$. Caesar died in e (= (9a))

b. [[on Wednesday]] = $\lambda e \in D_v$. e is on Wednesday

c. [[Caesar died on Wednesday]]

= $\lambda e \in D_v$.[[Caesar died]](e) = 1 and [[on Wednesday]](e) = 1

= $\lambda e \in D_v$. [$\lambda e \in D_v$. Caesar died in e](e) = 1 and [$\lambda e \in D_v$. e is on Wednesday](e) = 1

= $\lambda e \in D_v$. Caesar died in e und e was on Wednesday

- *Saturation of the event argument position:*

  There are three ways for the event argument position to be saturated in the semantic composition:

i. Introduction of a covert event variable (11a); OR

ii. EXISTENTIAL CLOSURE over the event argument position (11b); OR

iii. by combination with an adverbial quantifier; (11c).

(11) a. F: What's happening over there? A: The kids are playing the drums.

[[11aA]] = 1 iff the contextually given event $\mathbf{e_3}$ is a playing of the drums by the kids

⇒ The event variable e_3 takes as its value the unique event that is introduced by the question and whose nature is under discussion.

b. Reginald studies in Legon.

[[(11b)]] = 1 iff **there is an event** of Peter studying that takes place in Legon.

⇔ $\exists e$ [study'(peter', e) $\wedge$ in'(e, Legon')]

⇒ Existential quantification over events (i.e. *there is an event* in the truth conditions) is brought about by existential closure by means of a covert existential operator $\exists_{EC}$:

(12) [[$\exists_{EC}$]] = $\lambda E \in D_{<v,t>}$. $\exists e$ [E(e)] ⇒ SECTION 5

c. Peter **always** solves the questions.

4. Adverbial Quantifiers

(Lewis 1975, Berman 1987, Heim 1990, de Swart 1993, von Fintel 1994, 1995)

Q: What is the meaning of adverbial quantifiers ?

- Adverbial Quantifiers in English:

(13) a. If Peter is sad, he *always/ mostly / usually/ often/ seldom/ never* whistles a tune.

b. Peter *always/ mostly / usually/ often/ seldom/ never* whistles a tune.

⇒ The quantificational domain of adverbial quantifiers can be overtly restricted by an *if-/ when-* clause, cf. (12a), but restriction can also be implicit (12b).

⇒ Adverbial quantifiers are realized between SpecTP and SpecvP

- *Questions:*

i. What kinds of objects DO constitute the quantificational domain of Q-adverbs?

ii. Can the semantic meaning of adverbial quantifiers be captured in terms of Generalized Quantifier Theory ?

(14) a. [[each]] = $\lambda P \in D_{<e,t>}. \lambda Q \in D_{<e,t>}.$ for all z, P(z) =1: Q(z) = 1

b. [[always]] = ???

⇒ Adverbial quantifiers have a spezial affinity to events/situations that should be reflected in their formal semantic analysis. !

4.1 Adverbial quantifiers as quantifiers over sets of events/situations (Heim 1990, de Swart 1993, v. Fintel 1994, 1995)

- *Formal Implementation:*

Adverbial quantify over sets of entities

(15) a. AQ (E_1) (E_2) = 1 iff the set of events E_1 stands in that relation to the set of events E_2 that is expressed by AQ

b. TYPE(AQ): <<v,t>, <<v,t>,t>>

(16) [[always]] = $\lambda P_{<v,t>}. \lambda Q_{<v,t>}.$ for all events e, such that P(e) = 1: Q(e) =1

- *Application*

(17) a. Always, [if it rains], [Peter gets sad]

b. [[always]] ({e: it rains in e}) ({e: Peter gets sad in e})

(18) a. [[always if it rains]] =

$[\lambda P_{<v,t>}.\lambda Q_{<v,t>}.$ for all events e, such that P(e)=1: Q(e) =1] (λe. it rains in e) =

$\lambda Q_{<v,t>}.$ for all events e, such that it rains in e: Q(e) =1

b. [[18a]] =

[$\lambda Q_{<v,t>}$. for all events e, such that it rains in e: Q(e) = 1] (λe. Peter gets sad in e)

= 1 iff for all events e, such that it rains in e, Peter gets sad in e.

- *On the difference between adnominal and adverbial quantification:*

  The restriction of adnominal quantifiers is always (partially) determined by their NP-complement.

$\Rightarrow$ The restriction of adverbial quantifiers can optionally be made explicit by means of if/when-clauses (18a), but such an overt restriction is not mandatory

$\Rightarrow$ In many cases, the restriction of an adverbial quantifier is solely restricted by contextual factors, which are – in some languages prosodically marked.

$\Rightarrow$ This gives rise to the quantificational scheme for AQs in (19) (von Fintel 1994, 1995):

(19) AQ_e (C(e)) ([[vP]](e)) (C: context variable; [[vP]] = sentence meaning - AQ)
restriction nuclear scope

(20) Peter always wins.

AQ		**C(e)**		**[[vP]](e)**
$ALWAYS_e$	(e is	some game	in which Peter engages)	(Peter wins in e)
		some competition		
		some contest		
		some lottery		

- *Deriving QVE-effects with indefinite NPs and adverbial Quantifiers*:

(21) ***A Texan*** always drinks beer.

= All Texans drink beer

$\Rightarrow$ The meaning of (21) comes out correctly assuming that:

i. The meaning of always is as in (16)

ii. The indefinite NP *a Texan* denotes a function of type <e,t>: $\lambda x \in D_e$. x is a Texan

iii. The individual variable(s) introduced by *Texan* are saturated by EXISTENTIAL CLOSURE

(22) a. LF(21): $always_e$ [$\exists$x [x is a Texan in e]] [$\exists$x [x is a Texan and x drinks beer in e]

b. [[(21)]] = 1 iff for all situations e, such that there is a Texan in e: there is a Texan that drinks beer in e

- *Conclusion*

  The introduction of event arguments into the semantic representation

i. allows for a treatment of vP-adjuncts as semantic modifiers of event types

ii. allows for a treatment of Q-adverbials as quantifying over sets of events

BUT event saturation often involves the compositional procedure of EXISTENTIAL CLOSURE

5. Existential Closure in Bura (Zimmermann 2007)

Q: Is the application of existential closure over events and/or individuals ever indicated overtly?

A: Yes ! Bura marks existential closure over individual AND event arguments if these are not saturated by any other means.

- The distribution of *adi:*

i. *adi* is mandatory (with most verbs) in negated clauses, cf. (23a), in verbless thetic clauses, cf. (23b), and in existential cleft-structures, cf. (23c).

(23) a. pindar **adi** ata sa mbal **wa**
P. ADI FUT drink beer NEG
'Pindar will not drink beer.'

b. akwa saka laga [*mda* **adi** ka mwanki ntufu]
at time some person ADI with wife five
'Once upon a time, there was a man with five wives.'

c. *mda* **adi** [ti tsa kuga].
person ADI REL 3sg invite
'There is somebody that he invited. / SOMEBODY, he invited.'

ii. *adi* is illicit in affirmative episodic sentences, cf. (24ab).

(24) a. tsa **(*adi)** masta *su*
3SG ADI buy thing
'She bought something.'

b. *mda* **(*adi)** si
person ADI come
'Somebody/ A man came.'

iii. *adi* is not a dummy verb to be inserted in the absence of a full lexical verb:

- unlike verbs, *adi* precedes the aspectual marker (23a);
- *adi* can co-occur with lexical verbs (23a);
- lexical verbs are not obligatory in Bura clauses (25a);
- *adi* cannot occur in clefts with referential or quantified expressions (25b):

(25) a. sal-ni [mdi-r hyipa]
man-DEF person-of teaching
'The man is a teacher.'

b. **kubili* **adi** (an) [ti tsa kuga]
K. ADI PRT REL 3sg invite
INTENDED: 'It is Kubili that he invited.'

- *Generalizations:*

i. *adi* occurs whenever an individual or event variable must be existentially bound, but cannot be bound by *alternative means*

ii. *adi* can co-occur with variable-introducing indefinite NPs, but never with referential or quantified expressions.

- *The analysis:*

  In the unmarked case, all variables introduced by indefinite subject and object NPs are existentially bound by the predicate-modifying variant of the verb (26b).

(26) a. tsa **(*adi)** masta *su*
  3SG ADI buy thing
  'She bought something.'

  b. $[\![\text{masta su}]\!] = [\![\text{masta}_2]\!]([\![\text{su}]\!])$

  $= [\lambda P \in D_{<e,t>}.\lambda x \in D_e.\lambda e.\ \exists y\ [P(y)\ \&\ x \text{ bought } y \text{ in } e]\ ](\lambda x \in D_e.\ \text{thing'}(x))$

  $= \lambda x \in D_e.\lambda e.\ \exists y\ [\text{thing'}(y)\ \&\ x \text{ bought } y \text{ in } e]$

⇒ In the absence of verbs, (23bc) , some other element must existentially close off the indefinite variables: *adi*

⇒ the outermost argument of the verb, i.e. the event argument, cannot be closed off by the verb itself, hence another element must step in to existentially close off the event variable, as required under negation (24a).

Q: Why would existential (event) closure be mandatory with negation ?

⇒ The restriction in (27) is cross-linguistically attested for more familiar languages: see Herburger (2002) on Romance, and Zeijlstra (2004) on Germanic languages.

(27) $*[\![\text{NEG}]\!](\lambda e.\ \varphi(e))$

(28) Yesterday, Peter did not see a cat. (= universal negative event negation)

  i. $\neg\exists$**e** [time(e) ⊆ yesterday' ∧ ∃x [cat'(x) ∧ **see'**(e, peter, x)]]
  ≈ **there is no event** of Peter's seeing a cat that took place yesterday

  ii. $\exists$**e** [time(e) ⊆ yesterday' ∧ ∃x [cat'(x) ∧ **¬see'**(e, peter, x)]]
  ≈ there is an event of Peter not seeing a cat that took place yesterday

  iii. [time($g(e_1)$) ⊆ yesterday' ∧ ∃x [cat'(x) ∧ **¬see'**($g(e_1)$, peter, x)]]
  ≈ the contextually given event e_1 of Peter not seeing a cat took place yesterday

- *Possible reason behind (27):*

  Perhaps it is just too uninformative to negate an event predicate, given that events are typically not sortally restricted and the complement set of event predicates is in principle unbounded.

⇒ excluding a single event of Peter seeing a cat may leave open too many possibilities…

- *Conclusion*

  The syntactic and semantic behaviour of the Bura morpheme *adi* lends cross-linguistic support to the assumption of a fourth compositional procedure in natural language semantics (next to FUNCTIONAL APPLICATION, PREDICATE MODIFICATION & RESTRICT):

  EXISTENTIAL CLOSURE over individual and event arguments.