B4: The role of lexical information in word formation and the semantics of sentence and discourse

Hans Kamp and Antje Roßdeutscher

Universität Stuttgart
Institut für maschinelle Sprachverarbeitung
– Logik und Sprachphilosophie –
Azenbergstr. 12
D 70174 Stuttgart
antje@ims.uni-stuttgart.de

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Continued investigation of the internal root-based structure of verbs. Special attention to

- The classification of roots: what properties of roots must be assumed as given in order to explain what types of words can be built from which roots?
- How are argument positions determined in the course of building structures from roots, and how are these positions filled?
- Monotonic and non-monotonic aspects of the semantics of words built from more than one root
We doubt that (word-)syntax is exo-skeletal. The semantics of roots is decisive for the (word-)syntactic constructions which the roots is expected to enter.

Borer (2005)

If F1 is a functional category, i.e. T(ense), then LD is the verb.

listem1 : Argument2; listem2 : Argument1

a. (the) dog boat(ed) (three) sinks
b. (the three) sink(s) boat(ed) (some) dogs

c. (The) sink dog(ged) (the) boat

d. (The) boat(s) dog(ed) the sink

e. (The three) dog(s) sank (the) boat

Any root can enter syntactic structure anywhere.
B4 Lexical information: word-formation: root based verbal constructions

Our view:

\[ \sqrt{\text{sink}} \Rightarrow [\varepsilon \ y \ \text{sink}(\varepsilon, y)] \]

\[ \sqrt{\text{sink}} \text{ licences internal argument in vP-context as opposed to the F}_i \text{s} \]

\( \emptyset \)-derived noun. (a) Artefact functional for sinking events. (German: Spülbecken) (b) spatial configuration brought about by a sinking event (German: Senke).
The existence of entity-denoting \( \emptyset \)-derived nouns seems restricted, and unexpected.

We agree with the DM view: roots have no syntactic category.
Our point: Still roots may license argument structure.

**DM-principle**: functional heads n or v close off the semantic interpretation of the root, be that interpretation expected or unexpected.

nP and vP are local domains.

Phases (Marantz, Arad 2003)

• Our aim: Exploit those local domains in lexical semantic constructions which support inferences.
B4 Lexical information: word-formation: root based verbal constructions

- Roots don’t carry their semantics on their sleeves.

\[ \sqrt{\text{streich}} \sim \]
\[
\begin{array}{ll}
\text{e} & \times \\
\text{STRIKE}(\text{e}) & \text{die Wand streichen, (paint the wall)} \\
\text{x= Agent}(\text{e}) & \\
\end{array}
\]

* Eulenspiegel’s Streiche(E’s practical jokes)

\[ \sqrt{\text{streich}} \]
\[
\begin{array}{ll}
\text{e} & \ y \\
\text{STRIKE}(\text{e}, \text{y}) & \text{durch die Gegend streichen (to wander about)} \\
\text{CHANGE-OF-LOC}(\text{e}, \text{y}) & \\
\end{array}
\]

The exo-skeletal view: syntactic patterns (given from universal grammar) are decisive for argument structure.

Our view: semantic verbal pattern are decisive

\[ \sqrt{\text{streich}} \sim \]
\[
\begin{array}{ll}
\text{v} & \\
\text{LINE}(\text{v}) & \text{d. Paragraphen streichen (to delete) etwas} \\
\text{SPATIAL-CONFIG.}(\text{v}) & \\
\end{array}
\]

unterstreichen; (to underline s.th.) Strich (line).

Our findings: entity-readings of \textit{Unterstreichung Streichung} stem from entity-denoting roots.

- Question: How common is the ambiguity of roots?
B4 Lexical information: word-formation: root based verbal constructions

- roots license argument structure under v-heads as well as under n-heads

\[ \sqrt{\text{end}} \sim \Box \begin{array}{c} \text{e} \\ \text{Y} \\ \text{END(e,Y)} \end{array} \]

Das Konzert endet / the concert ends

\[
\begin{array}{c}
vP \\
\langle e', \text{the concert(y)} \rangle \\
v \\
rP \\
\text{comp} \\
\sqrt{\text{end}} \\
\text{das Konzert} \\
das Ende des Konzerts.
\end{array}
\]

the end of the concert

\[
\begin{array}{c}
nP \\
\langle e', \text{the concert(y)} \rangle \\
n \\
rP \\
\text{comp} \\
\sqrt{\text{end}} \\
\text{des Konzerts} \\
des Konzerts.
\end{array}
\]

*Sein Ende des Konzerts; *sein Fall des Apfels
* der Pianist ended das Konzert
*the pianist’s/ *his end of the concert

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Lexical information: word-formation: root based verbal constructions

- Event-denoting roots may enter the verbal structure just like non-eventive entity-denoting roots

(Following the pattern *bepflastern* (to pave) *bestuhlen* (furnish with chairs),...)

**Question:** How common is this phenomenon?  
**We expect:** not very common.

sie beendet das Konzert (nach) ihrer Beendung des Studiums/Konzerts

```
x y s
the concert(y)
END(e',y)
s: HAVE(e',y)
x = Agent(e') e' CAUSE s
```

```
v/vP

PP

<s,>
y e
the concert(y)
END(e,y)
s: HAVE(y,e)

<s,>
das Konzert

v

<e',>
```

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Verbal Lexicon

14.11.2008
das Konzert beenden

verbal type: be-recht-ig-en \(\sqrt{\text{recht}}\) (right) (to entitle) be-leid-ig-en \(\sqrt{\text{leid}}\) (sorrow) (to insult), be-mächt-ig-en \(\sqrt{\text{macht}}\) (power) (to usurp)

\[
\begin{array}{c}
\text{das Konzert(y)} \\
\text{s:HAVE(y,e)} \\
\text{END(e,y)}
\end{array}
\]

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• head-movement as constructive mechanism

Der Pianist be-end-ig-te das Konzert

\[
\begin{array}{c}
\sqrt{\text{end}+ \text{ig} + \text{be} + \text{v}} \\
\text{das Konzert} \\
\sqrt{\text{end}+ \text{ig} + \text{be}} \\
\text{der Pianist} \\
\text{vP} \\
\text{v} \\
\text{das Konzert}
\end{array}
\]
Is construction of verbs generally monotonic?

die Tür aufschließen (to unlock the door)

slightly simplified for ease of reading.

Problem: The root √schließen is not genuinely a 'manner'-root.
Same Problem: ab-steigen (to climb down)

• Our expectation: restricted to action descriptions
Is construction of verbs generally monotonic?

\[ \text{die Tü r schließen} \quad \text{die Schließung der Tü r} \]

\[ \begin{align*}
\langle vP \rangle & \quad \langle \text{die Tü r} \rangle \\
\langle v \rangle & \quad \langle \text{s} \rangle \\
\langle \text{the door(y)} \rangle & \quad \langle \text{e'} \rangle \\
\langle \text{CAUSES} \rangle & \quad \langle \text{s:¬OPEN(y)} \rangle
\end{align*} \]

* \text{die Aufschließung der Tü r} is ungrammatical; open and ¬open would conflict.
roots and frames

- **FRAMES** (in the sense of Fillmore) constrain the interpretation of verbs constructed from roots.

\[
\sqrt{\text{schreib}} \rightsquigarrow \text{WRITE}(e) \\
\text{Agent}(e) = x
\]

FRAME: effected-theme(s,y), stuff-of(s,z), res(s,e); supporter(s,r)

einen Brief schreiben  
eine Tür be-malen

diagram

entity-reading *Beschreibung, Bemalung*: y, REPRESENTATION(y)
Particle construction: *ein Wort an-schreiben*  

\[
\begin{array}{c}
\text{vP} \\
\text{PP} \\
\text{ein Wort} \\
\text{an} \\
\emptyset \\
\text{r}
\end{array}
\]

\[
\begin{array}{c}
\text{v/vP} \\
\text{v} \\
\sqrt{\text{schreib}}
\end{array}
\]

\[
\begin{array}{c}
\text{vP} \\
\text{PP} \\
\text{einen Baum} \\
\text{an} \\
\emptyset \\
\text{z}
\end{array}
\]

\[
\begin{array}{c}
\text{v/vP} \\
\text{v} \\
\sqrt{\text{mal}}
\end{array}
\]

*an* creates argument-slots \(y\) and \(r\) \(an\) creates argument-slots \(r\) and \(z\)

Semantically, \(an\) has a **topological** interpretation.

1. \(\text{AN}(z,r)\). stuff-of-(s,z) denotation of *Anschrieb* (= the chalk) *mit Kreide* (with chalk); supporter(s,r).
2. \(\text{AN}(r,z)\) *mit Leuchtfarbe* (with luminous paint)

- Connection to corpus-linguistic methods: These patterns should be detectable from the semantic classification of the arguments filling the created slots.
The formulation of a significant fragment (of German, possibly also of English) with an explicit DRT-based semantics. Such a fragment can serve as a test-bed for the issues listed above and also permit us to address some fundamental questions about a syntax-semantics interface. An explicit 'word-syntax — DRT’-interface’ would be an option for addressing those questions.
• Construction principles

• The semantics of roots may license argument slots.
• Possibly all vP-internal argument slots are created by roots.
• Argument-slots dispensers are property-denoting roots; event-denoting roots; (non-eventive) sortal relational roots; prepositions; pre-fixes. We represent them with the help of binding requirements. Those binding conditions underly hierarchical constraints: referential / non-referential argument; relans/relatum (internal/external arguments of P-heads).
• Eventive roots without non-referential argument-slots may be extended along common semantic patterns (e.g. √schlag: motion, sound, activity,...)
• Eventive roots with 'agentive' slots may be extended via P-adjunction (non-core-transitives)

• Functional heads may license argument slots;
  • a-heads (e.g. -ig); voice; heads of 'causative' projection; probably not v;
• The semantics of non-eventive sortal roots typically lack structure for creating argument-slots. These roots enters the structure via negotiation of (functional and non-functional) heads which create argument-structure.
• Semantic interpretation under MERGE

  • unary-relational heads may merge with a complement (e.g. properties); binary-relational roots merge with complement and specifier (e.g. P-heads)
  • saturation of unary and binary-relational roots may specify (a) a state, (b) a change of state or (c) an event in context. Integration of such states and events occur under merge with a functional head either leading to (a) a causally interpreted bi-eventive structure or via event-identification yielding some mono-eventive structure.
  • the v-head introduces a binding condition for the referential argument

    • Semantics construction is monotonic in general, non-monotonicity is marginal and detectable.
• The role(s) of (different notions of) causation, intentionality and volition in lexical semantics: causal and intentional structure of verbs; causation- and intention-related prepositions (e.g. *durch*, *wegen*, *trotz*)
Factive and eventive causation

- Two notions of causation:
  - eventive: Er wurde durch einen Schuss getötet.
    ‘He was killed by a shot’. (agent of killing = agent of shot)
  - factive: Er wurde wegen eines Schusses getötet.
    ‘He was killed because of a shot’. (agent of killing ≠ agent of shot)

- variants of factive causation:
  - simple cause
  - reason: motivation of causing agent
  - interpretation is determined by scopal relations to
    - intentionality/attitudes
    - modality
  - SIMPLE CAUSE: Er starb wegen des Schusses. (‘He died from the shot’).
  - REASON: Er wurde wegen des Schusses/Mordes getötet. (‘He was killed because of the shot/murder’.)
  - SIMPLE CAUSE: Er muss wegen des Schusses/Mordes getötet werden. (‘He must be killed because of the shot/murder.’)
The investigation of various types of context sensitivity which involve elements of indexicality and/or choice of perspective. *hin- und her, kommen/gehen/fahren*; indexical temporal adverbs; *jetzt, morgen, vorhin*; dimensional adjectives, *20 cm lang/20 cm hoch*

- This is a challenge for the process of justification of lexical requirements in *specific* contexts; within particles, at adjunction sites, w.r.t. antecedent descriptions, w.r.t. a 'story' (*hin- und her*), w.r.t. the speech situation (*her- hin*).  
- Are the justification mechanisms alike at the different levels?  
- DRT provides a uniform account to deal with all those levels.
kommen, hin-kommen


\[
\begin{array}{c}
\text{tomorrow(p) party(p)} \\
\text{In Tübingen(p)}
\end{array}
\]

\[
\begin{array}{c}
\text{hin-} \\
\{ \langle r_{0, \text{ind}}, r_1 \rangle \}
\end{array}
\]

\[
\begin{array}{c}
vP \\
\text{Prtc}
\end{array}
\]

\[
\begin{array}{c}
vP \\
\text{vP}
\end{array}
\]

\[
\begin{array}{c}
\text{Att}(x, \langle \text{BEL} \ r_i \subseteq \text{FRONT}(e') \rangle) \\
\times r_x
\end{array}
\]

\[
\begin{array}{c}
\text{COME}(e', y)
\end{array}
\]

\[
\begin{array}{c}
\text{Addr.(y)}
\end{array}
\]

\[
\begin{array}{c}
\text{come}(e', y)
\end{array}
\]

\[
\begin{array}{c}
0, \text{ind} = r_{\text{sp,now}} \\
\text{r}_x \quad \text{(place of attitude-bearer)} \\
\text{r}_1 \quad \text{(anti-indexical reference point)}
\end{array}
\]

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How 3-D-objects are described in PPS

[Lang:1989] contains a detailed and path-breaking study of the meaning and use of the dimensional adjectives of German: *lang* (long), *breit* (wide), *dick* (thick), *hoch* (high), *tief* (deep), and many others.

(a) Der Ziegelstein ist 20 cm lang, 11 cm breit und 7 cm dick.
   
   the brick is 20 cm long, 11 cm wide and 7 cm thick

(b) Der Ziegelstein ist 20 cm breit, 11 cm tief und 7 cm hoch.
   
   the brick is 20 cm wide, 11 cm deep and 7 cm high

(c) Der Ziegelstein ist 20 cm hoch, 11 cm tief und 7 cm breit.
   
   the brick is 20 cm high, 11 cm deep and 7 cm wide

(b) \models Der Ziegelstein liegt. \hfill the brick is lying
(c) \models Der Ziegelstein steht. \hfill the brick is standing
(a) \notmodels Der Ziegelstein liegt. (a) \notmodels Der Ziegelstein steht.

• *hoch* high describes dimensions in alignment with Vert in Primary Perceptual Space. The vertical of the brick in (b) is the minimal dimension of the brick, in (c) the maximal.

In (a) the brick is described in another description strategy, which is not perspectival (and doesn’t select hoch, high for dimension description)