Lexical entries & clauses

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The problem

The inadequacy of PS-rules

a.  * John devoured.
    John fainted.

b.  * Cezanne fainted the apple.
    Cezanne painted the apple.

c.  * John ate the apple the pear.
    John gave the woman the apple.
A lexical entry for *fox*

<table>
<thead>
<tr>
<th>PHONOLOGY</th>
<th>faks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEFINITION</td>
<td>member of one of many <em>Canidae</em> species</td>
</tr>
<tr>
<td>CAT</td>
<td>N</td>
</tr>
<tr>
<td>COUNT</td>
<td>+</td>
</tr>
</tbody>
</table>
Augment lexical entries with something we call an *argument structure*, which represents the meaning of an open class word as a *predicate*, and identifies the *roles* and *grammatical functions* of the predicate’s arguments.

The argument structure of a predicate constrains lexical insertion.
Argument structure

sing  \[\langle \text{AGENT}\rangle\]

slap  \[\langle \text{AGENT, GOAL}\rangle\]

love  \[\langle \text{EXPERIENCER, STIMULUS}\rangle\]

give  \[\langle \text{AGENT, THEME, RECIPIENT}\rangle\]
Subcategorization

**sing**

\[
\langle \text{AGENT} \rangle \\
| \\
\text{SUBJ} 
\]

**slap**

\[
\langle \text{AGENT, GOAL} \rangle \\
| \\
| \\
\text{SUBJ} \quad \text{OBJ} 
\]

**love**

\[
\langle \text{EXPERIENCER, STIMULUS} \rangle \\
| \\
| \\
\text{SUBJ} \quad \text{OBJ} 
\]

**give**

\[
\langle \text{AGENT, THEME, RECIPIENT} \rangle \\
| \\
\text{SUBJ} \quad \text{OBJ} \quad \text{OBL} 
\]

\[
\langle \text{AGENT, THEME, RECIPIENT} \rangle \\
\text{SUBJ} \quad \text{OBJ2} \quad \text{OBJ} 
\]

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Valence alternation I

a. John ate the apple.
John ate.
b. John devoured the apple.
* John devoured.
c. John is melting the snow.
The snow is melting.

\[
\text{eat} \quad \left[ \begin{array}{c|c|c}
\langle \text{AGENT, PATIENT} \rangle \\
\text{SUBJ} & (\text{OBJ}) \\
\end{array} \right]
\quad \text{melt}_1 \quad \left[ \begin{array}{c|c|c}
\langle \text{AGENT, THEME} \rangle \\
\text{SUBJ} & \text{OBJ} \\
\end{array} \right]
\]

\[
\text{devour} \quad \left[ \begin{array}{c|c|c}
\langle \text{AGENT, PATIENT} \rangle \\
\text{SUBJ} & \text{OBJ} \\
\end{array} \right] 
\quad \text{melt}_2 \quad \left[ \begin{array}{c|c}
\langle \text{AGENT} \rangle \\
\text{SUBJ} \\
\end{array} \right]
\]
Valence alternation II

a. John gave Mary his old radio.
   John gave his old radio to Mary.

b. John made the log into a canoe.
   John made a canoe out of the log.

\[
\begin{align*}
\text{give} & : \langle \text{AGENT, THEME, RECIPIENT} \rangle \\
& \quad \mid \text{SUBJ} \quad \text{OBJ} \quad \text{OBL} \\
\text{make} & : \langle \text{AGENT, SOURCE, PATIENT} \rangle \\
& \quad \mid \text{SUBJ} \quad \text{OBJ} \quad \text{OBL} \\
\text{give} & : \langle \text{AGENT, THEME, RECIPIENT} \rangle \\
& \quad \mid \text{SUBJ} \quad \text{OBJ2} \quad \text{OBJ} \\
\text{make} & : \langle \text{AGENT, SOURCE, PATIENT} \rangle \\
& \quad \mid \text{SUBJ} \quad \text{OBL} \quad \text{OBJ}
\end{align*}
\]
Lexical Insertion

The diagram illustrates the process of lexical insertion in a sentence structure. The sentence "a dog walks" is analyzed and revised to reflect the insertion of lexical phrases. The original structure on the left is compared to the revised structure on the right, showing how the lexical phrases are inserted into the sentence.
Principles for annotated PS-rules

\[ S \rightarrow \text{NP} \ V \ (\text{NP}) \ (\text{NP}) \ (\text{PP}) \]
\[ \text{SUBJ} \quad \text{OBJ} \quad \text{OBJ2} \quad \text{OBL} \]

**Well-formedness**

a. **COMPLETENESS**: Every obligatory Grammatical Relation in the subcategorization of a Verb must be assigned to a clause-mate of the Verb.

b. **COHERENCE**: Every non-adjunct Grammatical Relation assigned to a clausemate of a verb \( V \) must be present in the subcategorization of \( V \).

c. **UNIQUENESS**: No Grammatical Relation assigned more than once by a single verb.
Violations I

Completeness

\[
S \\
\text{NP} \quad \text{V} \\
\text{Det} \quad \text{N} \quad \uparrow \\
\text{the} \quad \text{dog} \quad \uparrow \\
\langle \text{AGENT, PATIENT} \rangle \\
| \\
\text{SUBJ} \quad \text{OBJ}
\]
Violations II

Coherence

The boy faints.

The dog faints.

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Violations III

Uniqueness

\[
S \\
\downarrow \quad \text{devours} \\
\begin{array}{c}
\text{NP} \\
\text{SUBJ} \\
\text{Det} \quad \text{N} \\
\uparrow \quad \uparrow \\
\text{the} \quad \text{dog}
\end{array}, \\
\begin{array}{c}
\text{NP} \\
\text{OBJ} \\
\text{Det} \quad \text{N} \\
\uparrow \quad \uparrow \\
\text{the} \quad \text{bone}
\end{array}
\begin{array}{c}
\text{NP} \\
\text{OBJ} \\
\text{Det} \quad \text{N} \\
\uparrow \quad \uparrow \\
\text{the} \quad \text{steak}
\end{array}
\]
Uniqueness in English

a. No new principle is really needed to rule the sentence on the previous slide. The PS-rule already SAYS there can be only one object:

\[ S \rightarrow NP \ V \ (NP) \ (NP) \ (PP) \]

\[ \text{SUBJ} \quad \text{OBJ} \quad \text{OBJ2} \quad \text{OBL} \]

b. This is because, for the simple examples we’ve looked at, English does not really require a uniqueness principle. For simple clauses with canonical word order, it generally assigns unique phrase structure positions for the argument grammatical functions.

c. Other languages don’t work this way. In case marking languages with free word order, for example, there is no single phrase structure position assigned to subjects. The uniqueness principle has some bite.

d. Also in more complicated English sentences, with “movement” (raising, Wh-questions), the uniqueness principle has bite.