Combinatorial Aspects of PPs Headed by Raising Prepositions

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\( P_1 \)
$P_1 + N$
P₁ N₁ P₂ NP Expressions

\[ P_1 + N + P_2 \]
$P_1 N_1 P_2 NP$ Expressions

$$P_1 \ + \ N \ + \ P_2 \ + \ NP$$
$P_1 N_1 P_2 N_1 P_3 N_1 P_4$ Expressions

\[ P_1 + N + P_2 + NP \]

in connection with this problem
**P}_1{{N}_1}_{P}_2{{NP} Expressions**

\[ P_1 + N + P_2 + NP \]

in connection with this problem

by dint of hard work
<table>
<thead>
<tr>
<th>$P_1$</th>
<th>+</th>
<th>$N$</th>
<th>+</th>
<th>$P_2$</th>
<th>+</th>
<th>NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>connection</td>
<td>with</td>
<td>this problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by</td>
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<td>hard work</td>
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<tr>
<td>by</td>
<td>means</td>
<td>of</td>
<td>natural selection</td>
<td></td>
<td></td>
<td></td>
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\[ P_1 + N + P_2 + NP \]

- in connection with this problem
- by dint of hard work
- by means of natural selection
- in contrast to international trends

**P₁N₁P₂NP Expressions**
Overview

- Syntactic properties of $P_1 N_1 P_2 N_P$ expressions
Overview

- Syntactic properties of $P_1N_1P_2NP$ expressions
- Analysis of [Fries 88]
Overview

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  - Analysis of [Trawiński 03]
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- Summary and Outlook
in Verbindung mit diesem Problem

in connection with this problem

‘in connection with this problem’
in Verbindung mit diesem Problem

in connection with this problem

‘in connection with this problem’

möchte ich darauf hinweisen, dass ...

would like I DA_on point_out that

‘I would like to point out that ...’
in *einer/ *der/ *seiner/ *Peters Verbindung mit diesem Problem ...

in a/ the/ his/ Peter’s connection with this problem
Quantification, Determination, Modification, $P_2$NP Omission

in *einer/ *der/ *seiner/ *Peters Verbindung mit diesem Problem ...

in *a/ *the/ *his/ Peter’s connection with this problem

in *enger/ *unerwarteter Verbindung mit diesem Problem ...

in close/ unexpected connection with this problem
in *einer/ *der/ *seiner/ *Peters Verbindung mit diesem Problem ...

in a/ the/ his/ Peter's connection with this problem

in *enger/ *unerwarteter Verbindung mit diesem Problem ...

in close/ unexpected connection with this problem

in [Verbindung mit diesem Problem], *die uns betrifft ...

in connection with this problem which us concerns
in *einer/ *der/ *seiner/ *Peters Verbindung mit diesem Problem ...

in a/ the/ his/ Peter’s connection with this problem

in *enger/ *unerwarteter Verbindung mit diesem Problem ...

in close/ unexpected connection with this problem

in [Verbindung mit diesem Problem], *die uns betrifft ...

in connection with this problem which us concerns

*in Verbindung ...

in connection
The Analysis of Fries (1988)

diesem Problem ('this problem')
Arguments against the Analysis of Fries (1988)

mit Hilfe von dem Buch/ des Buches
with help of the book/ the book$_{GEN}$

‘by dint of the book’
Arguments against the Analysis of Fries (1988)

mit Hilfe ??von dem Buch/ des Buches

with help of the book/ the book$_{GEN}$

‘by dint of the book’

in Verbindung womit/damit

in connection WO_with/ DA_with

‘in connection with what/with it’
Arguments against the Analysis of Fries (1988)

mit Hilfe ??von dem Buch/ des Buches

\textit{with help of the book/ the book}^G{}_{E\ N}

‘by dint of the book’

in Verbindung womit/damit

\textit{in connection with/ with it/}

‘in connection with what/ with it’

in Verbindung mit diesem Problem und mit seiner Lösung

\textit{in connection with this problem and with its solution}

‘in connection with this problem and with its solution’
The Analysis of Fries (1988)

diesem Problem ('this problem')
in ('in')

Verbindung ('connection')

mit ('with')

Combinatorial Aspects of PPs Headed by Raising Prepositions – p.8
The Selection

Combinatorial Aspects of PPs Headed by Raising Prepositions – p.9

```
P''
P'  PP
P
  N
  in ('in')
  Verbindung ('connection')
mit diesem Problem
('with this problem')
```
The Structure of a PP Headed by a Raising Preposition

Combinatorial Aspects of PPs Headed by Raising Prepositions – p.10
RP 1:
Every element in the PP can be attributed some meaning with which it occurs also outside the particular combination under consideration.
Regularity Properties (RPs) for PPs

RP 1:
Every element in the PP can be attributed some meaning with which it occurs also outside the particular combination under consideration.

RP 2:
The meaning of the entire PP is arrived at by combining the meanings of its parts in a regular way.
in einem Buch von Chomsky

*in a*  *book*  *of*  *Chomsky*

‘in a book by Chomsky’
in einem Buch von Chomsky

in a book of Chomsky

‘in a book by Chomsky’

hat er über diese Theorie gelesen

has he about this theory read

‘he read about this theory’
The Structure of the PP in einem Buch von Chomsky

\[ \lambda V.P.\text{in}'(\lambda Q \exists x (\text{buch}'(\text{chomsky})(x) \land Q(x)))(V P) \]

\text{in einem Buch von Chomsky}

\text{('in a book by Chomsky')}

\[ \lambda N P \lambda V.P.\text{in}'(NP)(VP) \]

\text{in ('in')}

\[ \lambda P \lambda Q \exists x (P(x) \land Q(x)) \]

\text{einem ('a')}

\[ \lambda x.\text{buch}'(\text{chomsky})(x) \]

\text{Buch von Chomsky ('book of Chomsky')}

\[ \lambda y \lambda x.\text{buch}'(y)(x) \]

\text{Buch ('book') von Chomsky ('by Chomsky')}
### Three Classes of $P_1 N_1 P_2 NP$ Expressions

<table>
<thead>
<tr>
<th></th>
<th><em>in Verbindung mit x</em> ('in connection with x')</th>
<th><em>an Hand von x</em> ('by means of x')</th>
<th><em>in Anbetracht von x</em> ('in consideration of x')</th>
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<td><strong>RP1:</strong></td>
<td>Every element in the PP can be attributed some meaning with which it occurs also outside the particular combination under consideration.</td>
<td>+</td>
<td>-</td>
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<td><strong>RP 2:</strong></td>
<td>The meaning of the entire PP is arrived at by combining the meanings of its parts in a regular way.</td>
<td>+</td>
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The External Selection Approach of [Soehn 03]
The Phrasal Lexical Entry Approach of [Sailer 00]

The **INTERNAL IRREGULARITY PRINCIPLE**

\[
\begin{array}{l}
\text{phrase} \\
\underline{\text{COLL +}}
\end{array}
\Rightarrow \left( \text{IE}_1 \lor \ldots \lor \text{IE}_n \right)
\]

The **WORD PRINCIPLE**

\[
\text{word} \Rightarrow \left( \text{LE}_1 \lor \ldots \lor \text{LE}_n \right)
\]

The **ID PRINCIPLE**

\[
\begin{array}{l}
\text{phrase} \\
\underline{\text{COLL –}}
\end{array}
\Rightarrow \left( \text{HC} \lor \text{HA} \lor \text{HM} \lor \text{HF} \right)
\]
The Structure of the PP *an Hand von Prolog*

```
phrase
  PHON{'an, Hand, von, Prolog'}
  SYNS LOC CAT
  HEAD 3
  VAL COMPS{\lambda V by-means-of'(prolog)(V)}
  CONT \lambda x \lambda V by-means-of'(x)(V)

H

C

phrase
  PHON{'von, Prolog'}
  SYNS [CONT prolog]
  LOC
  COLL

C

H

word
  PHON{'an'}
  SYNS LOC
  CAT
  HEAD prep
  ARG-ST LOC CAT VAL COMPS{\lambda \lambda Q,an'(P)(Q)}
  CONT \lambda P \lambda Q,an'(P)(Q)

word
  PHON{'Hand'}
  SYNS LOC
  CAT
  HEAD noun
  ARG-ST LOC CAT
  VAL COMPS{\lambda x hand'(x)}
  CONT \lambda x hand'(x)
```
We have presented syntactic properties of $P_1 N_1 P_2 NP$ combinations and have sketched the HPSG-based raising analysis for these expressions.
Summary and Outlook

- We have presented syntactic properties of $P_1 N_1 P_2 N_2$ combinations and have sketched the HPSG-based raising analysis for these expressions.

- Based on this analysis, we have investigated whether the semantic representation of these expressions can be derived combinatorial.
Summary and Outlook

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- Applying two criteria of regularity, we have specified three semantic classes of $P_1 N_1 P_2 NPs$. 
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We have presented two HPSG-based approaches that can account for all that data.
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We have presented two HPSG-based approaches that can account for all that data.

The raising analysis for $P_1 N_1 P_2 NP$ sequences, the external selection approach of [Soehn 03], and the phrasal lexical entry approach [Sailer 00] should be implemented and their interaction tested and evaluated.
Thank you!