

Lexical constraints in construction grammar:
methodological implications of a theoretical account

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Two claims

1. Usage-based construction grammar gives useful cues on how to deal with data
 - Methodologically attractive
2. Usage-based construction grammar offers a straightforward account of two types of lexical constraints
 - Theoretically attractive

What is usage-based construction grammar?

Usage-based linguistics

- Does not care about (un)grammaticality. Cares about usage.
- Attempts to explain language usage without recourse to domain-specific cognitive principles

Construction grammar

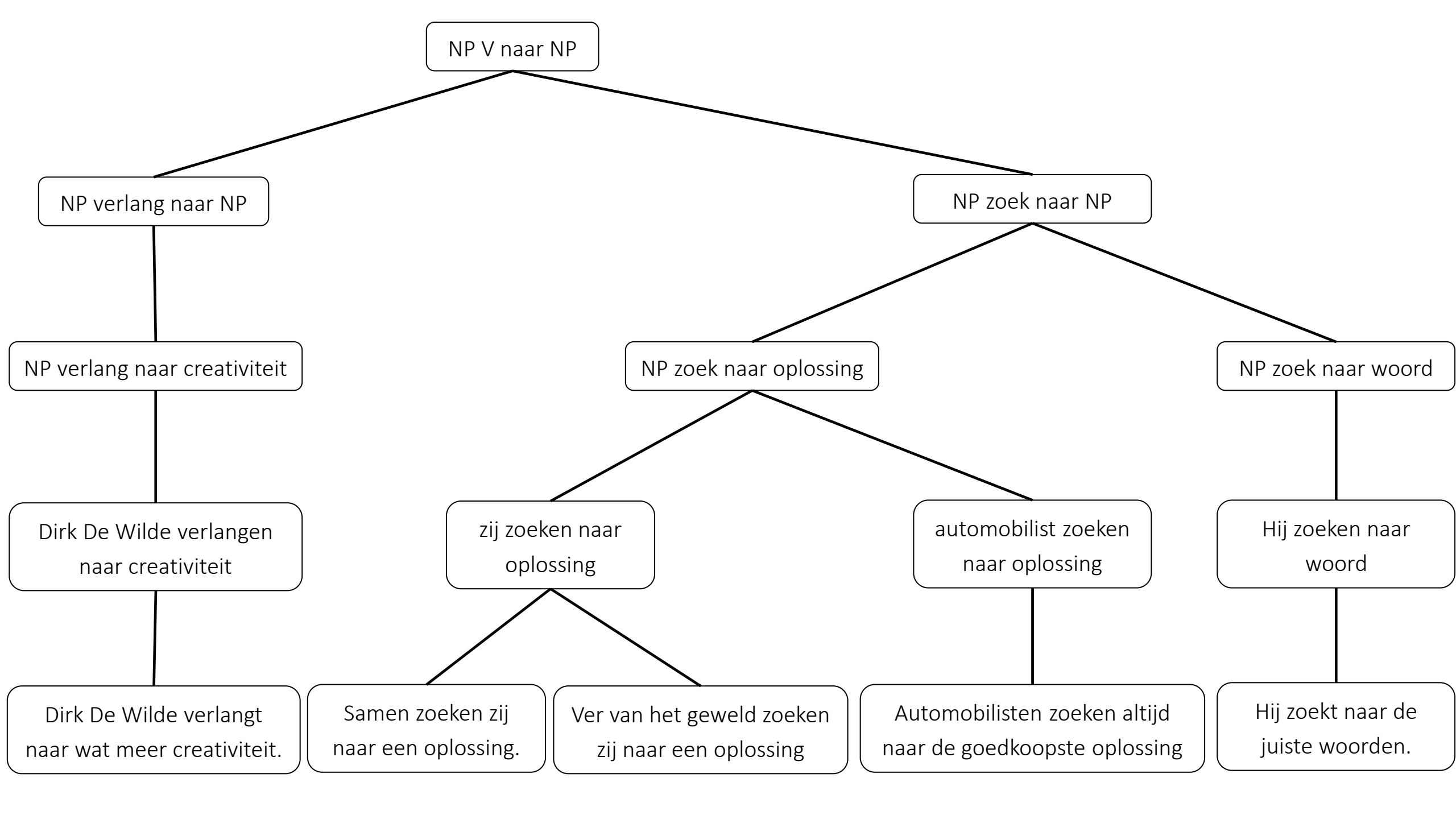
- Constructicon: structured assembly of constructions that may be combined to form new utterances

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Case study: What determines the presence of the seemingly optional preposition *naar* 'to' in Dutch?

1. *In geval van een uitzetting zoeken zij een oplossing.*
'In case of eviction, they look for a solution.'
2. *Samen zoeken zij **naar** een oplossing.*
'Together, they are looking for a solution.'
3. *Hij (...) verlangt op korte termijn harde maatregelen.*
'He desires measures to be taken in the short term.'
4. *De politiek verlangt nu **naar** scherpere maatregelen (...)*
'Politicians now desire more strict measures.'
5. *Om mijn kennis te verbreden, schreef ik politici (...) en peilde hun meningen.*
'To broaden my knowledge, I write to politicians and gauged their opinions.'
6. *'What's in a name' dachten we en peilden **naar** jullie mening.*
"What's in a name", we thought, and gauged your opinion.'



NP V naar NP

NP verlang naar NP

NP zoek naar NP

NP verlang naar creativiteit

NP zoek naar oplossing

NP zoek naar woord

Dirk De Wilde verlangen naar creativiteit

zij zoeken naar oplossing

automobilist zoeken naar oplossing

Hij zoeken naar woord

Dirk De Wilde verlangt naar wat meer creativiteit.

Samen zoeken zij naar een oplossing.

Ver van het geweld zoeken zij naar een oplossing

Automobilisten zoeken altijd naar de goedkoopste oplossing

Hij zoekt naar de juiste woorden.

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Formulating a hypothesis at a highly schematic level

Prepositional intransitive construction with *naar* vs. transitive construction

NP V naar NP

NP V NP

Formulating a hypothesis at a highly schematic level

- Lexical Origin Hypothesis: schematic constructions obtain their meaning from their most prototypical lexical slot fillers, e.g.
 - *Give*: shorter recipients → English ditransitive construction [NP V NP NP], e.g. *I'll give you all the help you need*
→ associated with the meaning of *give*, viz. 'transfer of possession'
- How to test this hypothesis: a lexical filler, e.g. a verb, will more readily combine with a construction that is semantically coherent, i.e. that has a similar or a compatible meaning, e.g.
 - *Offer*: will more often combine with the English ditransitive construction, even if it does not occur with short recipients
 - *Send*: will less often combine with the English ditransitive construction, even if it does not occur with long recipient

Naar-construction

Collexeme	Collostr. strenght
<i>gaan</i> 'go'	923,830
<i>kijken</i> 'look'	532,119
<i>trekken</i> 'pull'	272,823
<i>verwijzen</i> 'refer'	258,146
<i>komen</i> 'come'	251,058

Transitive construction

Collexeme	Collostr. strenght
<i>hebben</i> 'have'	4,101,778
<i>krijgen</i> 'get'	2,602,924
<i>doen</i> 'do'	2,410,269
<i>zien</i> 'see'	1,297,011
<i>nemen</i> 'take'	1,190,952

For each alternating verb_i, e.g. *zoeken* 'search', *verlangen* 'desire', *bellen* 'phone',...

VERBAL SEMANTIC COHERENCE TO THE NAAR-CXN =

$$10 \left(\frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{naar-cxn collexeme}_n}, \overrightarrow{\text{verb}_i} \right)}{5} - \frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{trans-cxn collexeme}_n}, \overrightarrow{\text{verb}_i} \right)}{5} \right)$$

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Prediction: Among the instances of all alternating verbs, the higher a verb's value for VERBAL SEMANTIC COHERENCE TO THE *NAAR-CONSTRUCTION*, the stronger its predilection for the *naar-construction*.

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NP verlang naar creativiteit

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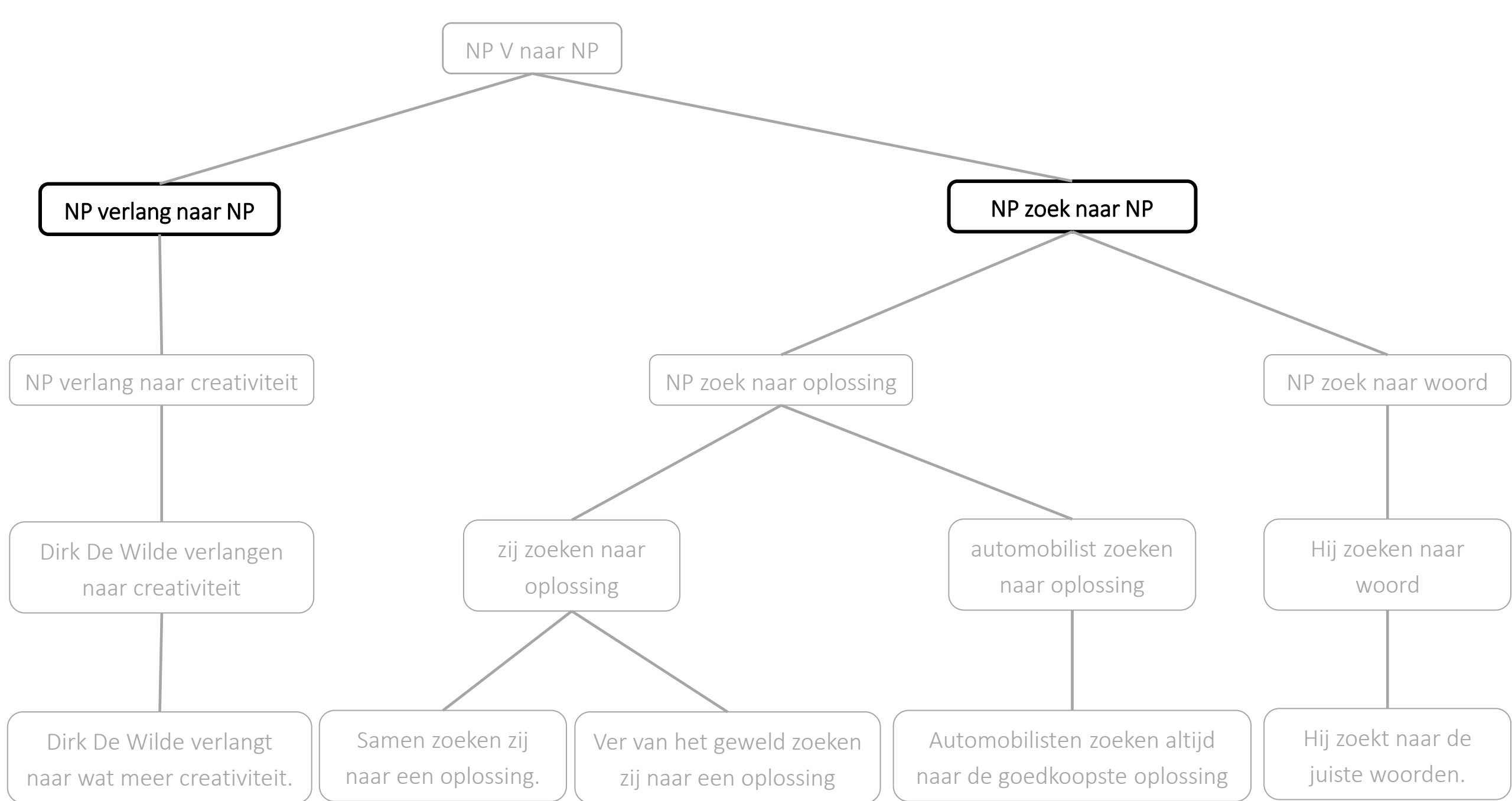
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Formulating hypotheses at an intermediate level of schematicity

Formulating a hypothesis at an intermediate level of schematicity

- *verlang-naar*-construction vs. transitive *verlang*-construction NP verlang naar NP vs. NP verlang NP
- Lexical Origin Hypothesis: schematic constructions obtain their meaning from their most prototypical lexical slot fillers

Verlang-naar-construction

Collexeme	Collostr. strenght
<i>kind</i> 'child'	262
<i>leven</i> 'life'	255
<i>rust</i> 'rest'	234
<i>dood</i> 'death'	213
<i>huis</i> 'house'	181

Transitive verlang-construction

Collexeme	Collostr. strenght
<i>bewijs</i> 'proof'	179
<i>tegenprestatie</i> 'countereffort'	154
<i>bijdrage</i> 'contribution'	131
<i>offer</i> 'sacrifice'	129
<i>garantie</i> 'guarantee'	127

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For every other object_i:

SEMANTIC COHERENCE TO THE VERLANG-NAAR-CXN =

$$10 \left(\frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{verlang-naar-cxn collexeme}_n}, \overrightarrow{\text{object}_i} \right)}{5} - \frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{trans-verlang-cxn collexeme}_n}, \overrightarrow{\text{object}_i} \right)}{5} \right)$$

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Among the instances of the verb *verlangen* 'desire', the higher an object's value for SEMANTIC COHERENCE TO THE *VERLANG-NAAR-CONSTRUCTION*, the stronger its predilection for the *verlang-naar*-construction.

Formulating a hypothesis at an intermediate level of schematicity

- *zoek-naar*-construction vs. transitive *zoek*-construction

NP zoek naar NP

vs.

NP zoek NP

- Lexical Origin Hypothesis: schematic constructions obtain their meaning from their most prototypical lexical slot fillers

Zoek-naar-construction

Collexeme	Collostr. strenght
<i>oplossing</i> 'solution'	22,564
<i>manier</i> 'manner'	3,738
<i>alternatief</i> 'alternative'	3,677
<i>overlevende</i> 'survivor'	2,887
<i>oorzaak</i> 'cause'	2,372

Transitive zoek-construction

Collexeme	Collostr. strenght
<i>oplossing</i> 'solution'	24,675
<i>toevlucht</i> 'refuge'	14,695
<i>contact</i> 'contact'	14,416
<i>heil</i> 'salvation'	13,871
<i>toenadering</i> 'rapprochement'	7,944

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<i>heil</i> 'salvation'	13,871
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For each object_i:

SEMANTIC COHERENCE TO THE ZOEK-NAAR-CXN =

$$10 \left(\frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{zoek-naar-cxn collexeme}_n}, \overrightarrow{\text{object}_i} \right)}{5} - \frac{\sum_{n=1}^5 \text{sim}_{cm} \left(\overrightarrow{\text{trans-zoek-cxn collexeme}_n}, \overrightarrow{\text{object}_i} \right)}{5} \right)$$

Overview

Prediction at a highly schematic level:

- Among the instances of all alternating verbs, the higher a verb's value for VERBAL SEMANTIC COHERENCE TO THE NAAR-CONSTRUCTION, the stronger its predilection for the *naar*-construction.

Predictions at an intermediate level:

- Among the instances of the verb *verlangen* 'desire', the higher an object's value for SEMANTIC COHERENCE TO THE VERLANG-NAAR-CONSTRUCTION, the stronger its predilection for the *verlang-naar*-construction.
- Among the instances of the verb *zoeken* 'search', the higher an object's value for SEMANTIC COHERENCE TO THE ZOEK-NAAR-CONSTRUCTION, the stronger its predilection for the *zoek-naar*-construction.

Testing the hypothesis at the highly schematic level

Data

- Extracted all instances of the 13 alternating verbs *bellen* 'ring', *graaien* 'grasp', *grabbelen* 'scramble', *grijpen* 'grab', *happen* 'snap', *jagen* 'hunt', *opbellen* 'ring up', *peilen* 'gauge', *schoppen* 'kick', *telefoneren* 'phone', *verlangen* 'desire', *vissen* 'fish' and *zoeken* 'search'
- From the Sonar-corpus (except the chat material, Tweets, text messages and discussion lists)
- Only those for which the country of origin is known, and the theme is expressed and not extraposed, no idiomatic uses (e.g. *soort zoekt soort* 'bords of the same feather flock together')
- Subjected to manual checking
- Left with 76,138 transitive observations and 17,530 prepositional observations

Analysis

- All data in one dataset
- Mixed logistic regression model: choice of variant
 - VERBAL SEMANTIC COHERENCE TO THE *NAAR*-CONSTRUCTION
 - COUNTRY
 - THEME COMPLEXITY
 - VERB-THEME ORDER
 - Interaction between THEME COMPLEXITY and VERB-THEME ORDER
- Random effects:
 - CORPUS COMPONENT
 - VERB

Hypothesis not confirmed

Testing the hypotheses at the intermediate level

Verlangen 'desire'

- Limit the dataset to only the instances of *verlangen* 'desire', excluding the top 5 collexemes and their diminutives: 725 transitive observations vs. 914 prepositional observations
- Mixed logistic regression model: choice of variant
 - SEMANTIC COHERENCE TO THE *VERLANG-NAAR*-CONSTRUCTION
 - OBJECTAL COHERENCE TO THE *NAAR*-CONSTRUCTION
 - COUNTRY
 - THEME COMPLEXITY
 - VERB-THEME ORDER
 - Interaction between THEME COMPLEXITY and VERB-THEME ORDER
- Random effects:
 - CORPUS COMPONENT
 - THEME LEMMA

Hypothesis confirmed

$p < 0.0001$

Zoeken 'search'

- Limit the dataset to only the instances of *zoeken* 'search', excluding the top 5 collexemes and their diminutives : 40,662 transitive observations vs. 8,843 prepositional observations
- Mixed logistic regression model: choice of variant
 - SEMANTIC COHERENCE TO THE *ZOEK-NAAR*-CONSTRUCTION
 - OBJECTAL COHERENCE TO THE *NAAR*-CONSTRUCTION
 - COUNTRY
 - THEME COMPLEXITY
 - VERB-THEME ORDER
 - Interaction between THEME COMPLEXITY and VERB-THEME ORDER
- Random effects:
 - CORPUS COMPONENT
 - THEME LEMMA

Hypothesis confirmed

$p < 0.0001$

Overview

Hypothesis at a highly schematic level:

- The higher an alternating verb's value for VERBAL SEMANTIC COHERENCE TO THE *NAAR*-CONSTRUCTION, the stronger its predilection for the *naar*-construction. **Not confirmed**

Hypotheses at an intermediate level of schematicity:

- The higher an object's value for SEMANTIC COHERENCE TO THE *VERLANG-NAAR*-CONSTRUCTION, the stronger its predilection for the *verlang-naar*-construction. **Confirmed**
- The higher an object's value for SEMANTIC COHERENCE TO THE *ZOEK-NAAR*-CONSTRUCTION, the stronger its predilection for the *zoek-naar*-construction. **Confirmed**

Conclusions

Descriptive findings

- *Verlangen* 'desire' and *zoeken* 'search' seem to use the alternation to express their own, idiosyncratic semantic construals, viz. 'desire as demand' vs. 'desire as longing for' and 'search as seek to make/get' vs. 'search as literally looking for'
- No evidence for higher level abstractions
- Further findings:
 - *Zoeken* 'search' partially functions at an even lower level of schematicity
 - *Peilen* 'gauge' also functions at the verb-specific level, expressing 'gauge as directly assess' vs 'gauge by asking'
 - Telephonic verbs, motoric verbs and venatic verbs appear to function at a higher level of schematicity

Discussion

1. Usage-based construction grammar gives useful cues on how to deal with data on lexical biases
 - Investigate data at various levels of schematicity: how to define levels
 - How to study the lexical biases at each level of schematicity: Lexical Origin Hypothesis

2. Usage-based construction grammar offers a straightforward account of two types of lexical constraints
 - Lexical items directly influence which grammatical form to use: e.g. *reden zoeken* ‘search reason’ ~ with *naar*, *aansluiting zoeken* ~ without *naar* because of semantic proximity
 - Lexical items determine the factors that influence which grammatical form to use: e.g. for *verlangen* ‘desire’, the use of *naar* is determined by a specific meaning difference, for *peilen* ‘gauge’, there is a regional difference, etc.

Want to know more?

Pijpops, Dirk, Dirk Speelman, Stefan Grondelaers & Freek Van de Velde.
2021. Incorporating the multi-level nature of the construction into
hypothesis testing. *Cognitive Linguistics* 32(3). 487–528.



Abralin-talk: <https://www.youtube.com/watch?v=A2y22Mrs5Ec&t=2919s>

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Extra slides

Conclusions

- Non-semantic motivating factors
 - Lectal differences: low level
 - Processing-related factors: very stable, high level

-
- <https://lirias.kuleuven.be/retrieve/548892>

Meso-level 3

NP V_{tel} naar NP
'phone to report'

Meso-level 2

NP verlang naar NP
'desire as long for'

NP zoek naar NP
'search as look for'

NP peil naar NP
'gage as directly judge'

Meso-level 1

NP zoek naar woord
'be lost for words'

NP zoek naar vorm
'try to get into
condition'

Constructs

Concrete
instance

Concrete
instance

Concrete
instance

Concrete
instance

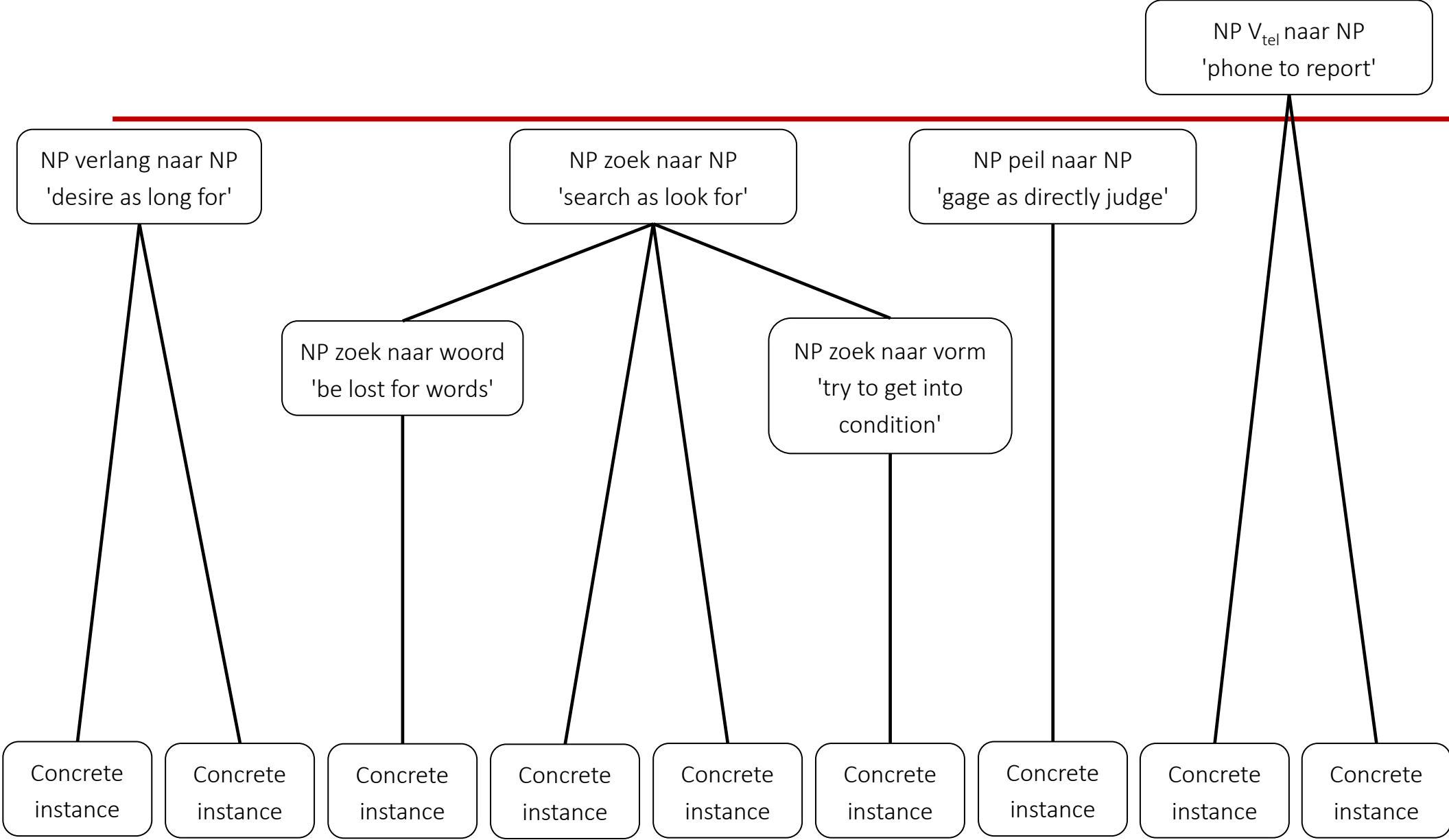
Concrete
instance

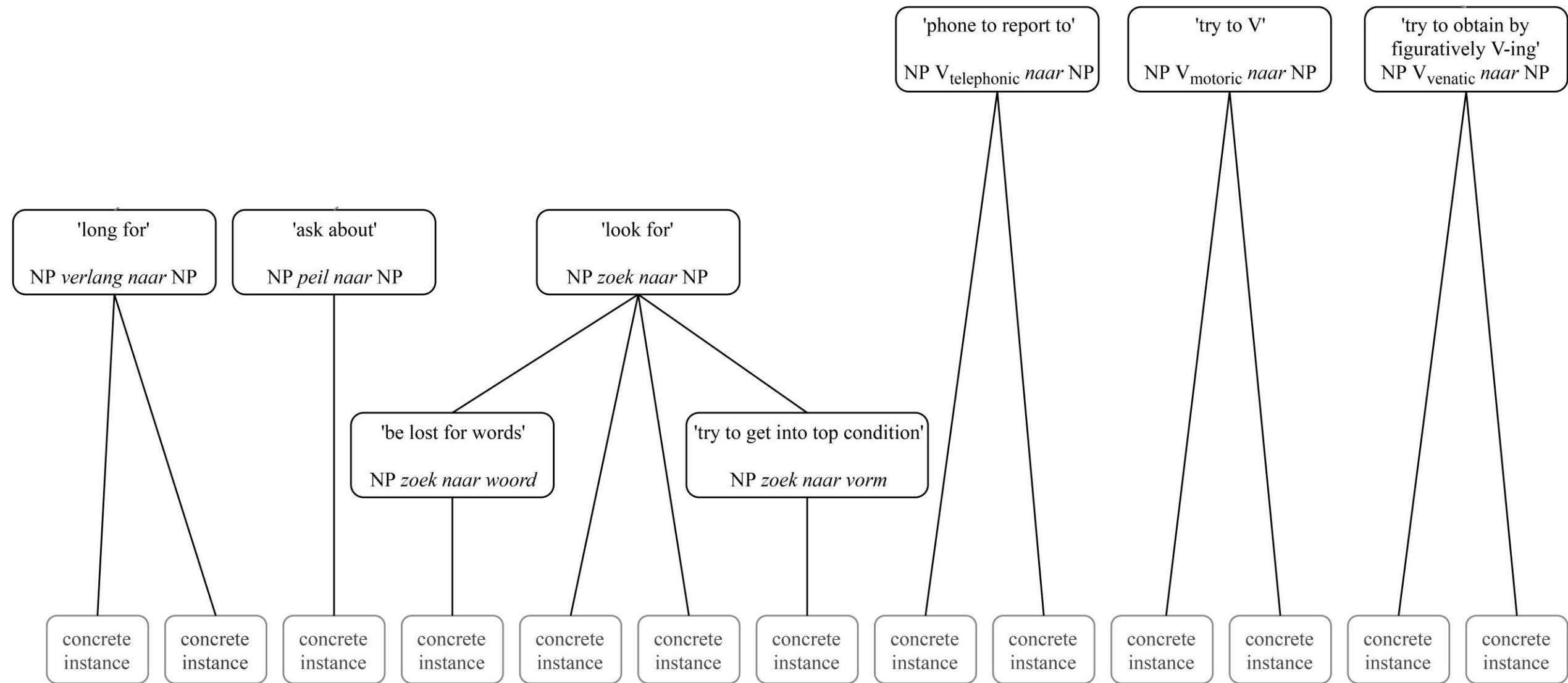
Concrete
instance

Concrete
instance

Concrete
instance

Concrete
instance





1. Dirk De Wilde **verlangt (naar)** wat meer creativiteit.

'Dirk De Wilde desires some more creativity.'

2. Automobilisten **zoeken** altijd **(naar)** de goedkoopste oplossing.

'Car drivers always look for the cheapest solution.'

3. Samen **zoeken** zij **(naar)** een oplossing.

'Together, they are looking for a solution.'

4. Hij **zoekt (naar)** de juiste woorden.

'He is looking for the right words.'

5. 'What's in a name' dachten we en **peilden (naar)** jullie mening.

“'What's in a name”, we thought, and gauged your opinion.'

Formulating a hypothesis at Meso-level 3

- Transitive construction vs. *naar*-construction

NP V NP

vs.

NP V naar NP

- Lexical Origin Hypothesis: schematic constructions obtain their meaning from their most prototypical lexical slot fillers
- Principle of Semantic Coherence: a lexical filler, e.g. a verb, will more readily combine with a construction that is semantically coherent, i.e. that has a similar or a compatible meaning

Formulating a hypothesis at Meso-level 2

- Transitive *verlang*-construction vs. *verlang-naar*-construction

NP verlang NP

vs.

NP verlang naar NP

- Lexical Origin Hypothesis: schematic constructions obtain their meaning from their most prototypical lexical slot fillers
- Principle of Semantic Coherence: a lexical filler, e.g. a theme, will more readily combine with a construction that is semantically coherent, i.e. that has a similar or a compatible meaning