The Order of Prepositional Phrases in the Structure of the Clause

Tesi di dottorato di Walter Schweikert

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0 Introduction

All three sentences above have the same meaning, though we find remarkable differences with respect to the order of the involved prepositional expressions. They all contain two locative PPs and one temporal. One of the locative expressions, "in Venice", specifies the location described by the other, "in Italy". Their order with respect to each other is preserved in all three languages. Both appear to the right of the temporal PP in German, but to the left of it in English and Italian.

All three sentences can be uttered out of the blue, which indicates that they have neutral informational structure. Changing the order between temporal and locative expressions results in a marked structure with non-neutral focus structure and associated intonation. Changing the order between the two locative phrases results in a different interpretation. Starting from the traditional point of view that all three prepositional modifiers are adjuncts these observations seem to be in odds. Adjunction is a free operation and should not give preference to a certain order. This leads us to the following questions:

Why do we have an order preference for prepositional modifiers in each language? Is this order attributed to semantic reasons? Why do we find reverse order between temporal and locative expressions in English and Italian with respect to the order in German? Why do we have the same order for the two locative expressions in all three languages? Why does English form a group with Italian and not with German?

English, though genetically more related to German, has an important parameter in common with Italian: Both are VO languages, German is an OV languages. This leads to the final question:

Can the differences between PP ordering related to the OV – VO order?

I try to give an answer to these questions with this work. Most of my work is concerned with modifying PPs as opposed to selected elements. I start with a short overview presenting important historical contributions to the syntactic theory of modifiers. Chapter 1 presents the traditional view of modifiers as syntactic adjuncts to VP and IP in GB and minimalist frameworks. It furthermore presents the innovations to syntactic theory that result from Kayne's antisymmetric restrictions on syntactic structure. This framework excludes the possibility of having several adjuncts to one and the same maximal projection. As a consequence of this restriction and based on data from many languages Cinque presented in 2000 a theory which stipulates a cascade of functional projections above the VP. Adverbs, auxiliaries and affixes are grouped into distinct classes each of which is related to one of these functional projections. It is this theory that I take as starting point for my analysis of prepositional phrases.
In Chapter 2, I propose a variant of an antisymmetric syntax whose basic elements are not simple words, which can be inserted into heads, but complete maximal projections. This proposal excludes head movement, leading to very general and abstract considerations about possible restrictions on movement. The rest of the Chapter speculates about the nature of parameters, based on recent work of Kayne.

Excluding head movement requires new ideas about verb movement up the syntactic tree. Chapter 3 proposes a theory of VP movement in order to attach the verb to its inflectional affixes. It is an attempt to integrate major parts of morphology into syntax. Central for the discussion is the Axiom of Word Boundary, which states that there is no word boundary between overt elements in the specifier and the head of the same maximal projection. Certain examples with agglutinating and fused morphemes are discussed in detail.

The two remaining chapters are devoted to prepositional modifiers.

In Chapter 4 I list several syntactic tests that can help to establish the base order between constituents. Three of them I used extensively with all possible combinations of 14 different PP types in German. The complete data can be found in the appendix. The evaluations of the tests give in all three cases a consistent, transitive hierarchy of thematical roles, which is nearly identical for all tests. Additional PP types and a fourth test are introduced and evaluated in a less extensive way. The resulting hierarchy correspond in relevant parts to Cinque's hierarchy of functional projections. The other elements have no correspondent adverb or affix in this hierarchy.

Chapter 5, finally, tries to derive the different surface orders in OV and VO languages.

Several analyses are presented and compared. A derivation with cyclic movements of the VP around each PP, followed by movement of prepositional material is suggested, which is compatible with the morphological analysis presented in Chapter 2. The notion of extended projection is generalised to modifiers which attributes to each modifier a rich syntactic structure with a low argumental part, a higher modifying layer and high projections related to pragmatic functions such focus and topic.

The work presented here can only open the door into a large field of future research which has to answer many other questions concerned with the inner structure of modifiers and their relation with argumental elements such as subject and object. If the integrations of other elements like adverbs and modals succeed we can arrive at a general theory of the syntax of modifiers.
1 Arguments and Modifiers

1.0 Introduction

Early syntactic views on sentence structure concentrated on the main predicate (the verb) and its (obligatory) arguments. Constituency and recursion were early observations of structuralist analysis. The distinction between internal (objects) and external arguments (subjects) was another milestone in syntactic theory. Attempts were made to generalize the observed structure of the sentence also to the internal composition of the single constituents (mainly the arguments). The next step was to represent the structure of a sentence and its constituents in a uniform way with the mathematical tool of tree structure that resulted in the well-known X-Bar theory. Predicates were viewed as heads of the constituent, internal arguments as complements. The status of the external argument was a bit more problematic, since it seemed to be seated outside the constituent projected by the predicate. Subsequent work focussed on more peripheral material of the sentence. Functional elements like determiners and complementizers were sometimes indispensable and were analysed as sitting in a specifier position just like certain auxiliaries. Modifiers like adverbs or prepositional phrases seemed to be totally optional and they were added to syntactic theory in the form of adjuncts.

In this chapter, I want to give a short overview of this era, before presenting more recent approaches that challenged the old model. In the 90s there appeared two major new theories, which tried to solve the problems that came up with a more detailed look at sentence structure. Chomsky's minimalist program presented a dynamic model of construction of sentences where complete words in the form of sets of features are inserted into the structure. Some of these features are uninterpretable, which gives motivation for movement. Kayne on the other side started with the observation of certain typological asymmetries. In order to give an explanation for this data he developed a theory, which set linear order of words in relation to syntactic hierarchy. The result is a restriction to X-Bar structure. Cinque presented a new view on modifier syntax, which is based on Kayne's antisymmetric approach.

1.1 Sentence constituents

Syntax as the science of the composition of sentences seeks to describe and explain the order of the constituents in a sentence and their relationships to each other. In order to achieve this goal linguists search for a theory that is powerful enough to account for any permissible sentence in any language, but at the same time restrictive enough to exclude all ungrammatical sentences – or at the level of languages – to exclude properties of languages, which are not found among the described human languages. Like any other scientific project (e.g. physics) it was natural to start with the examination of the properties of the most simple objects, in our case with the shortest sentences, which contain only indispensable elements, which means sentences that contain the main predicate and its arguments. The number of these arguments seems to differ depending on the verb, from zero to three:

- It rains (0)
- John sleeps (1)
- John kisses Mary (2)
- John gave Mary a book (3)
But these simple examples show, that nouns and verbs cannot be in all cases the only obligatory elements. In the first sentence, an expletive has to be added to fulfil the requirements of an overt subject in English, and in the last sentence, the determiner "a" was added to the common noun "book". Leaving these elements out would result in ungrammatical structures:

* rains
* John gave Mary book

Looking at more complex sentences, a large number of new elements appeared in the inventory of linguistic descriptive tools, which could not be omitted from certain sentences without rendering the sentence ungrammatical; for instance, complementizers, auxiliaries, infinitive markers, supporting "do" in questions etc. Closer inspection revealed that the inner composition of the words can have inflectional elements such as agreement and tense suffixes are obligatory in all sentences:

Gianni ha detto *(che) tu hai telefonato (Italian)
Gianni has said (that) you (have) called
John *(has) gone home
John wants *(to) sleep
*(Did) John go to work?
John sleep*(s)

But clearly these elements could not be viewed in any respects as arguments of the verb. They seemed to serve more a functional purpose and soon the distinction between lexical elements such as verbs, nouns, adjectives, adverbs, prepositions on the one side and functional elements like determiners, complementizers, auxiliaries, etc. was introduced.

For a long time certain classes of elements, such as adverbs, adjectives and circumstantial prepositional phrases, didn't attract much attention in the linguist world. They seemed to share a number of properties:

1. They were optional. In a sentence like:

   John kissed a (beautiful) girl (passionately) (in the garden)

everything seems dispensable except for the subject, the verb and the object. Even adjectives can be omitted without rendering the sentence ungrammatical or changing the semantics radically:

   John kissed a beautiful girl.
   * John kissed.
   * John kissed girl.
   * kissed a girl.
   John kissed a girl.

2. They seemed to be unordered. Both of the following sentences were considered equivalent and having the same interpretation:

   John worked for Mr. Miller in New York.
   John worked in New York for Mr. Miller.
3. The adding of these elements to a nuclear clause seemed to be unlimited.

4. They didn't seem to give an essential contribution to the meaning of the sentence:

The following sentences describe the same event. The difference is only the positioning on spatial or temporal scales:

- John kissed Mary on Friday.
- John kissed Mary on Tuesday.
- John kissed Mary in the garden.

These elements seemed to modify somehow the event described by the main predicate and its arguments, but not to change it radically.

The distinction between arguments and modifier was essential for dependency grammar. Tesnière defined the valency of the verb as the number of obligatory elements it selected. But soon it became clear, that it was not always straightforward to define the valency of a verb. Certain verbs like "eat" which seem to select clearly two arguments, a subject and an object, could be used in certain environments to permit deletion of the object:

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Johns eats an apple
?? John eats
   What is John doing? He is eating.
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Another problem with Tesnière's theory was his restriction to the elements counting as arguments. He accepts three types: subjects, accusative objects, indirect objects in dative or genitive case. Prepositional expressions were excluded. Certainly this was problematic. Take the following pair of sentences:

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John eats an apple
John sits on a chair
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Apart from the preposition there seems not to be much reason to distinguish between the argumental status of "an apple" and "on a chair". Their omission renders both sentences ungrammatical:

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* John eats
* John sits
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Their contribution to the semantics of the sentence is comparable: Both select out of a number of possible objects a certain type. Dative shift provides another example of semantic equivalence of an indirect dative object and its prepositional counterpart:

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John gives Mary a book
John gives a book to Mary
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Another problem arose with certain kinds of accusative objects. A verb like "run" which clearly was intransitive could get an accusative object in sentences like:

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John ran a mile
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A possible escape hatch could be the assumption that there were two different entries for "run" in the lexicon, one being intransitive and the other transitive. The problem with this solution is the productivity of the construction. "A mile" can be added to any motion verb, even if it freshly enters the language.

John skated a mile.

Another problem came up with passive constructions. The agentive part, which was the indispensable subject of the active counterpart, became optional.

It became necessary to invent tests to distinguish between arguments and modifiers. Jacobs (1986) presents 7 tests such as obligatoriness, argument status, semantic contribution which all seem to have fuzzy borders. He presents several examples to show that all the tests were independent of each other. I will not go into detail since the definitions themselves are fuzzy (e.g. "Beteiligtheit ... \text{BET}(X,Y) \text{ in } S \text{ gdw. } x \text{ in } S \text{ eine Entität bezeichnet, die an dem Vorgang oder Zustand, der von } Y \text{ ausgehend in } S \text{ dargestellt wird, beteiligt ist.}"). More of interest are some tests described in Helbig (1992).

Obligatoriness: Helbig is less restrictive and allows for sentences like

- Peter isst (einen Apfel)
  'Peter eats (an apple)'

- Peter steigt (in die Straßenbahn) ein
  'Peter enters the tram'

as opposed to

* Peter besucht
  'Peter visits'

Modalisation: if the modal "können" (can) can be used with the verb but without the constituent in question it is a modifier:

- Kann er essen?
  'Can he eat? (Is he able to eat)'

* Kann er besuchen?
  'Can he visit?'

"Und zwar" –modification: If a part of the sentence can be paraphrased by a "und zwar" (namely)-construction, it is a modifier:

- Peter isst, und zwar einen Apfel
  'Peter eats, namely an apple'
Another test is found in the literature that at first sight seems to be equivalent; the "did so"-test:

Peter aß einen Apfel im Restaurant
'Peter ate an apple in the restaurant'

But sometimes we get a clash with the "und zwar"-modification:

Peter stieg ein, und zwar in die Straßenbahn.
'Peter enters, namely the tram'

* Peter steigt ein, und er tat dies in die Straßenbahn.
'Peter enters and he did so in(to) the tram'

These few examples show that the line between arguments and modifiers is not easily drawn. On the other side the verb (or better: the nuclear event) imposes restrictions on the types of modifiers it permits. Well known from perfectivity tests is the restriction on "for-" and "in-" expressions indicating duration: Only imperfective states of affairs permit the modification with a durative modifier:

John was running for an hour
* The bomb exploded for an hour

On the other side only perfective events allow modification by "in-" PPs:

John painted the picture in an hour
* John is running in an hour (in the sense of having finished running an hour later)

Matter-modifications are very restricted. You can talk about a subject or read about it, but you cannot swim about it:

John talked about politics
* John swam about politics
* Bill gave Mary ten dollars about politics

Benefactives seem to be less restrictive but not totally free either:

John gave Mary ten dollars for Bill
John was running for his school
* John was sleeping for his girl friend

Temporals and Locatives, on the other side, seem to be able to modify any event without any restriction:

John was sleeping in the park on Sunday
The bomb exploded in the park on Sunday
John swam in the river on Friday
In Fillmore (1972) we find an interesting approach to the distinction between obligatory and optional participants. According to him every sentence represents an event, which prototypically involves several participants. The verb, as main predicate, selects a certain perspective of the event that renders one or two (or three) participants obligatory and the rest optional.

He gives the example of a commercial event, which involves a buyer, a seller, the goods and the exchange value (the money). A number of verbs describe the same event from different perspectives. In the particular event, Harry is the seller, the goods are roses, the price is five dollar and the buyer is the speaker.

If we choose the verb "sell" we view the process from the perspective of the seller, which becomes the subject and the roses are the object:

Harry sold a dozen roses.
Harry sold a dozen roses to me for five dollars

The verb "buy" takes the view of the buyer, the roses remain the object:

I bought a dozen roses
I bought a dozen rose from Harry for five dollars

If we were to keep the buyer the subject but choose the money as object we have to take the verb "pay":

I paid five dollars
I paid five dollars to Harry for a dozen roses

But note, that here again we can add temporal and locative modifiers freely, which according to Fillmore are not prototypical participants of this event.

A more recent contribution to the discussion we find in Dowty(2003). For him the distinction between arguments and modifiers (in his terminology "complements" and "adjuncts") is clearcut in semantic structure, but not always easy to determine. He starts his analysis with the following definitions:

An adjunct is 'optional', while a complement is 'obligatory':
- A constituent Y in a phrase [XY] (or in [YX]) is an ADJUNCT if and only if (i) phrase Xby itself (without Y) is also a well-formed constituent, and (ii) X (without Y) is of the SAME category as phrase [XY]. (X is in this case the HEAD of the phrase [XY].)
- Then a constituent Y in [XY] is a COMPLEMENT if and only if (i) X by itself (without Y) is not well formed, or else (ii) if it is grammatical, then X standing alone (does) not have the same category as in [XY] (and does not have exactly the same meaning as it has in [XY]).

An adjunct 'modifies' the meaning of its head, while a complement 'completes' its head's meaning.
- If Y is an adjunct, the meaning of [XY] has the same kind of meaning (same logical type) as that of X, and Y merely restricts [XY] to a proper subset of the meaning/denotation of X alone.
- Where Y is a complement in [XY], (i) the meaning of X by itself, without Y, is incomplete or incoherent. Else, (ii) X must be understood elliptical – the hearer
must imagine/infer some context-dependent or anaphoric meaning of the general kind of Y to "fill in" the semantic slot that X requires semantically. …

- Also, the same adjunct combined with different heads affects their meaning in the "same" way semantically (e.g. walk slowly vs. write slowly). But the same complement can have more radically different effects with different heads (e.g. manage to leave vs. refuse to leave).

(Dowty (2003,1f))

Dowty represents complements (arguments) and adjuncts (modifiers) in categorial grammar with different structures from which it automatically follows, a) that complements are closer to the verb, b) that they are obligatory, c) that adjuncts are optional and d) that adjunction is in principle unlimited.

After having clarified these notions he concentrates on expressions such as adjectives, adverbs and PPs, which commonly are used as clear modifiers, but in certain constructions, bear clearly properties of arguments. He uses the term Subcategorized Adjunct and proposes, that they should be analysed as complements.

As an example he discusses sentences with dative prepositional expression such as:

Mary explained the memo to John.
Mary rented the apartment to John.
John offered a glass of tomato juice to Mary.

In all three cases, the "to-PP" cannot be omitted without rendering the sentence ungrammatical. The semantic contribution of this PP-argument is furthermore highly dependent on the selecting verb. In the first case it is information, which is given to John, in the second case ownership of the apartment and in the third case only the mere option of having the glass of tomato juice.

Dowty contrasts this behaviour with directional PPs, introduced by the same preposition:

Mary kicked the ball to the fence.
John pushed the desk to the wall.
Sue slid the paperweight to the edge of the table.

In all three cases, the contribution of the PPs has the same semantic effect: adding the goal of the action to the description of the scenery.

Dowty refers to several predecessors, among them especially Anderson (1971), who claim that all actual instances of prepositional expressions are abstracted from original locative uses. Whereas many of the prepositions retain their original locative meaning others are reduced to grammatical markers.

Dowty proposes that all language-learners who encounter an expression headed by a locative preposition (such as "to" and "from") analyse it in a first step as a locative modifier. Only at a later step they will reanalyse the same expression as an argumental complement. This is what he calls the Dual Analysis.

So far, it seems, that certain types of adjuncts behave syntactically different, depending on the semantic predicate.

If we restrict ourselves for the moment to prepositional expressions, we can distinguish five types with respect to their boundedness by the verb:

1. totally obligatory, indispensable argument of the verb. Under no circumstances can the Object PP be omitted.
Der Besen lehnt an der Wand
'The brush leans against the wall'

* Der Besen lehnt
'The brush leans'

* Der Besen liegt nicht, er lehnt
'The brush does not lay, it leans'

2. The PP seems to have argument status and omitting it is odd in most cases, though in contrastive environments it becomes possible.

Das Bild hängt an der Wand
'The picture hangs at the wall'

?? Das Bild hängt
'The picture hangs'

Das Bild liegt nicht, es hängt
'The picture doesn't lie, it hangs'

3. The PP is a prototypical participant in the sense of Fillmore, but the specific verb chooses a perspective that excludes them from the set of obligatory arguments.

Harry sells three roses for five dollars
Harry sells three roses

4. The PP is not obligatory and does not belong to the set of prototypical participants, but can be added to the sentences.

Harry sold the roses on Sunday
Harry sold the roses

5. The PP is incompatible with the main predication (note that it is not always the verb that determines compatibility, but very often a bigger constituent).

* Harry sleeps for Mr. Miller
* Harry is eating in five minutes
  Harry eats an apple in five minutes

But does this imply a continuum of binding force between a verb and certain thematic roles?
In German, at least there is a straightforward syntactic test which is able to distinguish between two types of participants which we would like to identify with arguments and modifiers: Only the latter can be found in the "Nachfeld" (the position after the finite verb in subordinate clauses).
The German sentence is normally described as having a verb bracket, which consists of two positions for the verb, one in second position (the normal position of the inflected verb in main clauses) and at the end (the usual position of the verb in dependent clauses). In main clauses, in front of the inflected verb, we find topicalised material or elements in focus. This position is usually called "Vorfeld".
Hans traf Maria
'Hans met Maria'

Am Sonntag traf Hans Maria
On Sunday met Hans Maria
'Hans met Maria on Sunday'

Weißt du, dass Hans Maria traf?
Know you that Hans Maria met
'Do you know that Hans met Maria?'

Describing the right verb bracket as the very last position is not quite correct. You can find certain elements to the right of this position if they are destressed. This position is called Nachfeld. Arguments are clearly forbidden in this position:

Weißt du, dass Hans Maria am Mittwoch traf?
Weißt du, dass Hans Maria traf am Mittwoch?
* Weißt du, dass Hans am Mittwoch traf Maria?

This restriction also holds for argumental PPs:

Weißt du, dass Hans auf dem Stuhl sitzt?
Know you that Hans on the chair sits
'Do you know that Hans sits on the chair?'

* Weißt du, dass Hans sitzt auf dem Stuhl?

This seems to indicate that syntactically there is a distinction between arguments and modifiers. Fillmore's example shows that it is not semantics that determines the difference. In order to account for possibility of omitting the object in some cases we have to look for something else.

1.2 Representation in X-Bar structure

One of the great successes of early structuralist linguistics was the discovery of constituency in human language. Later, Chomsky could show that recursion was an important property of sentences. The same structure of predicate, arguments, modifiers and functional elements that we find in the sentence itself, could be found in certain arguments and modifiers. Noun phrases especially showed the same structural composition, the head noun behaving as a predicate, genitive noun phrases as arguments and adjectives as modifiers. Adjective and adverbial phrases as well as prepositional phrases seem to be structured internally in an analogous way.

The mathematical tool of tree structure was soon accepted as an appropriate mode of description. The idea was to represent arguments, modifiers and certain functional elements in a uniform way in their relation to heads. For various reasons (purely syntactic ones as well as arguments of learnability) most theories restrict trees structure to binary branching. This resulted in the 70s in the famous X-Bar structure with the following elements:

- Heads: Indispensable elements which determine the category of the whole projection. Single words as terminal elements of the tree sit always in head position. Predicates are viewed as heads of a projection.
- Complements: Position of the internal argument of a predicate. More general: material selected by the head. In this general view the inflection head selects a VP as its complement.


An example would be:

\[
\begin{array}{c}
\text{XP} \\
\text{specifier} \\
\text{Head} \\
\text{complement}
\end{array}
\]

where the theory does not define the linear order between sister nodes. The following trees are thus totally admissible examples:

\[
\begin{array}{c}
\text{XP} \\
\text{specifier} \\
\text{Head} \\
\text{complement}
\end{array}
\quad\quad
\begin{array}{c}
\text{XP} \\
\text{specifier} \\
\text{complement} \\
\text{Head}
\end{array}
\]

The order of the complement with respect to the head – the so called head parameter – was for a long time considered to be responsible for the difference between languages with verb-object order like English (VO-languages) and languages with the order object-verb like German (OV-languages).

Modifiers were represented through adjunctions, which are viewed as a doubling of nodes. Adjunctions can be done freely without any limits in number and without respecting a specific order. Some variants of the theory considered modifiers to be added freely to the right and the left.

Early theories considered adjunction to the intermediate position X’ as also possible. This was excluded in later theories. Nowadays only adjunctions to the head and to the maximal projection are considered:

Head adjunction:

\[
\begin{array}{c}
\text{XP} \\
\text{specifier} \\
\text{Head}_1 \\
\text{complement}
\end{array}
\quad\quad
\begin{array}{c}
\text{XP} \\
\text{specifier} \\
\text{Head}_1 \\
\text{Head}_2
\end{array}
\]
XP-adjunction: or:

```
XP
  \   \  
  adjunct specifier
    \   \ 
    X'  X'
       \  \ 
       Head complement Head complement
```

with a slight asymmetry between them: Most syntactic theories consider the XP-adjunction position (as well as the specifier position) a position for basic insertion, as well as a landing position for moved XPs, whereas there is no theory (to my knowledge) which permits basic insertion of heads in adjunct position.

Some theories don't make a distinction between XP-adjuncts and specifiers (in particular the antisymmetric theory of R. Kayne from 1994 as we will see later).

Whereas the order of several projections that sit in complement position is determined by selection, there exists no equivalent mechanism to give any ordering to adjuncts among each other. Any order should be possible.

Further developments of the theory of syntax arrived at a more extended structure of the sentence. The existence of several functional elements, which couldn't be located in specifiers of the same projection led to a layered structure with two functional projections above the VP: IP, as an abbreviation of "inflectional phrase", is headed by functional elements like auxiliaries, inflectional affixes or the English infinitive marker "to". In its specifier we find the external argument of the verb, the subject of the phrase. This certainly is a departure from the idea of presenting arguments in a uniform way or at least all in a local relationship to its predicate.

Above the IP in the outermost layer of the sentence we find the CP ("complementizer phrase") headed either by an overt complementizer or a covert question marker. Its specifier can host elements that were moved out of their original position to mark constituents under question (wh-elements) or in focus.

The overall X-Bar structure of a sentence can thus be represented as:

```
CP
  \   \  
  C'  C
     \   \ 
     IP  Subject
        \   \  
        I'  infl VP
           \   \ 
           X'  X
              \  \ 
              verb object
```
1.3 The Split Infl Hypothesis

In 1989 this model was refined in a remarkable essay by Pollock (Pollock (1989)) developing certain observations by Emonds 1978. It started with a comparison of the order of finite and non finite verbs in English and French with respect to certain adverbs and negation. In English we never find finite verbs (apart from "be", "have" and "do" or certain modals) in front of the negation "not",

* John likes not Mary

nor in front of certain adverbs such as "often":

* John kisses often Mary

as opposed to their French equivalents:

Jean (n’) aime pas Marie
Jean embrasse souvent Marie

If we take the position of adverbs to be stable during a derivation, and if we assume a universal base structure for all languages, we can explain this striking difference as a difference in verb movement. In both languages the negation and the adverb are generated above the verb. In French but not in English, the verb moves up across negation and the adverb, to a higher position. In infinitival sentences we do not find a difference in the order of the (infinite) verb and negation:

Not to get arrested under such circumstances is a miracle
* To get not arrested under such circumstances is a miracle

Ne pas regarder le télévision consolide l'esprit critique
NE not to watch television strengthen one's independence

* Ne regarder pas le télévision consolide l'esprit critique

In both languages it seems impossible for the infinitival verb to climb over the negation. So at first sight the difference in verb movement between the two languages seems to be neutralized in the case of infinitives. But with respect to certain adverbs Pollock discovers something totally unexpected:

To hardly speak Italian after years of hard work means you have no gift for languages
* To speak hardly Italian after years of hard work means you have no gift for languages

A peine parler l'italien après cinq ans d'étude dénote un manque de don pour le langues
Parler à peine l'italien après cinq ans d'étude dénote un manque de don pour le langues
While English infinitives are not allowed to climb over these adverbs, their French equivalents are. Note that the climbing in the French case is optional. If the French infinitival verb can climb above certain adverbs, but not above the negation, then there must be an intermediate landing position. That is Pollock’s surprising conclusion. Instead of having a single IP (InfIP) he expands it to a distinct TP (tense phrase) and AgrP (agreement phrase) with an optional NegP (negation phrase) in-between:

In T we find the tense suffix, in Neg the negation and in Agr the agreement suffixes. Finite tense is an operator which triggers movement in the French case. The finite verb moves first to Agr, takes it suffix (incorporates it) and both climb up over Neg to T:
In this way morphology is integrated via "affix hopping" into syntax. In English, the movement of the verb to Agr is blocked due to its very impoverished morphology. The HMC (head movement constraint) prohibits heads to make long distance movements without stopping at each intervening head. Therefore the verb cannot move directly to the T head. (Neg doesn't count in Pollock analysis as an intervening head). The important question is how the verb gets its tense morphology. Pollock's answer is: Affix lowering. The T head moves downward to the verb to provide it with its morphology. In the infinitival case, the verbs don't have tense features, so they don't have to move to T. English infinitives remain in base position just like finite verbs. French infinitives move to the Agreement node. Pollock's idea of splitting the single IP into two (or, with NegP, three) different projections was a great success, though in successive works the order of the two involved projections was inverted: AgrP is today usually assumed to be higher than TP. The idea of affix hopping also found a warm welcome in the linguistic community. But the lowering of affixes to the verb was an obstacle. Since it is commonly assumed that traces must be c-commanded, the lowering of an element was technically excluded. Thus the question of how the verb could possibly get its affixes in English gave rise to a paradigm revolution in generative grammar. But before we give a very brief introduction to this Minimalist program we need to introduce the level of LF.

1.4 The Level of Logical Form and Covert Movement

First hints of how to solve this conflict showed up in the eighties with the invention of LF and covert movement. One of its origins lies in the comparison of constituent question formation in different languages. In English we have the so-called wh-movement, which marks a question: The questioned constituent contains a wh word like "who", "what" or "when" and starts the sentence. Most analyses assume that this constituent has been moved from its base generated position. If it is
the object that is questioned for example, the wh-word is base generated in object position and then moved to the specifier of the CP. This movement is called wh-movement to distinguish it from other kinds of argument movements where arguments are moved into argument positions (spec IP):

Who(m) did you see?

can be analysed as:

\[
\text{[CP Who}_i \ [C\ [\cdots\ did\ you\ see\ t_i]]]
\]

where \(t_i\) denotes the (invisible) trace left by the moved element. But it is an interesting fact that in the case of two questioned elements only one moves to the front, in English. If for example the subject and the object are questioned we get:

Who saw whom?

instead of

Who whom saw?

or

Who whom did see?

But in Polish both elements move to the front:

Kto co robi?
Who what does
'Who does what?'

(Haegeman (1994,504))

In Chinese however we find the opposite pattern. No wh-element moves (wh in situ):

Zhangsan xiangzin shei mai-le shu
Zhangsan believe who buy-Asp book
'Who does Zhansan believe bought books?'

At this time it was commonly assumed, that at the end of the derivation all operators have to move to the left to a position from where they can c-command the elements in their scope (e.g. the whole sentence). How could we then possibly explain the elements in situ, e.g. in the base position? The answer gave rise to the T-model of the late Government and Binding framework: at the beginning of the derivation all elements are inserted in the so called D-structure which represents the predicate argument structure of the main verb. Subsequent movements result in S-structure which represents more or less the order of the words that we find in the spoken sentence, the surface order. From here the derivation splits into a branch leading to the logical form (LF) and one which leads to the phonological form (PF). On the branch to PF only post syntactic phonological (and maybe morphological) rules apply. At the end we have the phonetic representation of the string.
LF represents the logical and semantic relations of the elements of the sentence. Here all operators have to be in scope-taking positions, e.g. all the elements in their scope must be c-commanded by them. The branch to LF consists of only syntactic rules, but since they apply after S-structure they have no visible effect; the movements are covert.

Now we can explain the differences of wh-movement between languages in terms of overt, (before S-structure) versus covert movement: all languages have the same structure at LF. All wh-elements are at the beginning of the sentence. In Polish all wh-elements move in the branch between D-structure and S-structure. In English this is only allowed (and obligatory) for one element, the others moving covertly. In Chinese all wh-elements move covertly. This analysis could be useful to explain the problems that linguistic theory had with verb movement and affix lowering.

We could simply say, that all verbs move up to the highest head that bears affixes, but that in certain languages this movement (or part of the movement) is procrastinated until the covert branch to LF. French verbs move overtly, while English verbs do so covertly. This could be a nice solution, but unfortunately it brought up another riddle. If English verbs move to their affixes after S-structure, why do we see the affixes on the verb at the level of PF? The branch to LF should have no influence to its sister branch.

### 1.5 The Minimalist Program

In the early nineties Chomsky presented a radical new view of syntax, which could overcome the problems of verb raising and morphology. Instead of moving the verb to a position where it gets assigned an affix (or its affixes), or moving the affix to the verb, he assumes that all verbs, more generally all words, are inserted into the syntactic structure in their fully inflected form. Furthermore he abandons the idea of a complex D-structure at the beginning of the derivation in favour of a fully dynamical construction.

At the beginning of the derivation we only have the numeration, i.e. a collection of all words used in the sentence in their fully inflected form. These elements are put together to form constituents. Already built up constituents can be used to merge with other constituents. The sentence is thus built from the bottom (the verb) stepwise up to the top (the sentence). At each level of this derivation the highest node looks for another constituent with which to form two sister nodes of a new mother node. This other constituent can be either a constituent, which is
already subpart of the searching node and is moved up to the new position (Move), or it is an already built constituent independent of the searching tree (Merge).

**Move:**

Certainly this model no longer contains D-structure. But Chomsky also gets rid of S-structure. The derivation continues as above until LF. At a certain point of the derivation (and this point is highly language dependent) a second branch leads the sting (constructed up to then) to PF:

**Merge:**

One of the most fascinating elements of the Minimalist Program is the fact that every movement is motivated. Each word we find in the numeration has a set of syntactic, phonetic and semantic features. At LF only semantic features can be interpreted and at PF only phonetic features. All other features have to be stripped off during the derivation. Spell Out itself strips off all phonetic features and passes them over to PF. Semantic features that remain are fully interpretable at LF and are no problem to the cognitive system. But syntactic features have to be cancelled before LF. The way to do this is via paring two constituents bearing the
same feature in a local neighbourhood. This can be either a specifier head configuration or a head head adjunction. Uninterpretable features will be cancelled. Chomsky assumes that functional heads bear uninterpretable features which therefore attract lexical elements with matching features into a local neighbourhood.

In this way verbs start the numeration with all their affixes, each of which is paired with a feature. Above the VP we find the usual functional projections that bear features like aspect, tense, mode, which are non interpretable. So they attract the verb via head-head adjunction and cancel their own features, while the features of the verb remain being interpretable themselves.

At any step of this movement we can find the language specific Spell Out point, which strips away the phonetic features of the sentence and sends them to PF. Since the verb had all its morphology from the very beginning we have no problem with missing affixes.

Economy principles, that restrict the number of derivations, the size of the structure and above all, the distance of movement were implemented into the theory.

The Minimalist Program is a work in progress and subject to many subsequent modifications. The ideas of verb movement and head movement in general, though initially promising, have become more dubious in later formulations of the theory. But before coming back to more recent minimalist analysis I will present the contribution of R. Kayne to syntactic theory

1.6 Antisymmetry

Richard Kayne explores in (Kayne 1994) the outcome of a restricted theory of syntactic structure, which had great influence on following syntactic theories. He establishes a relationship between the hierarchical syntactic structure of a sentence and the linear order of the words in it. Starting from observed asymmetries in natural languages he proposes a restriction on X-Bar structure which, informally spoken, correlates (asymmetric) c-command to linear ordering (of terminals). Since his theory is of great importance for the following I will try to present it here in a formal way:

Basic for his proposal is the term 'asymmetrical c-command', which I will quote here:

$$X \text{ asymmetrically c-commands } Y \text{ iff } X \text{ c-commands } Y \text{ and } Y \text{ does not c-command } X$$

(Kayne(1994, 4)).

On first approach he adopts Chomsky's definition of c-command as

$$X \text{ c-commands } Y \text{ iff } X \text{ does not dominate } Y \text{ and every node that dominates } X \text{ dominates } Y.$$ 

Furthermore he introduces a function 'd' that maps each nonterminal node X to the set of terminal nodes d(X) that are dominated by X. This function can be extended to Cartesian products of two non terminals in a natural way, so that d(X,Y) = d(X) x d(Y) for two non terminal nodes X,Y.

His main axiom is now that the image of all pairs (X_i, Y_j), where X_i asymmetrically c-commands Y_j, is a total linear ordering of the set of terminal nodes. (Also called "The Linear Correspondence Axiom", LCA).

In other words:

a) If a nonterminal X asymmetrically c-commands another nonterminal node Y, than all terminals dominated by X precede the ones dominated by Y (in the PF string!).
b) To every two terminal nodes (words) p and q (q following p) there will be at least two nonterminal nodes X, dominating q, and Y, dominating p, with X asymmetrically c-commanding Y (and no pair where Y asymmetrically c-commands X).

Among the Consequences for X-Bar theory, that follow immediately are:

a) Phrases cannot have more than one head.
b) Phrases must be headed.
c) Phrases are binary branching.

A problem arises for the specifier position: Let's take a projection XP with a specifier YP, a head X and a complement ZP, the two latter both dominated by a node X'. Since X' asymmetrically c-commands all terminal nodes of the specifier YP and YP asymmetrically c-commands the head X (and all terminals under ZP), according to Kayne's definition we don't get a linear order between the material under YP and the material under X'. A theory like this would restrict us to phrases consisting only of heads and complements. A sentence structure would look like this:

\[
\begin{array}{c}
XP \\
\downarrow \\
X \\
\downarrow \\
YP \\
\downarrow \\
Y \\
\downarrow \\
ZP \\
\downarrow \\
Z
\end{array}
\]

This would give a mere sequence of words without any structuring, a highly undesirable result. In order to include specifiers Kayne introduces Chomsky's distinction between categories and segments and changes his definition of c-command:

\[
X \text{ c-commands } Y \text{ iff } X \text{ and } Y \text{ are categories and } X \text{ excludes } Y \text{ and every category that dominates } X \text{ dominates } Y.
\]

(Kayne(1994,16))

From this perspective all the nodes dominating a head (X) and projected by it (X', X'') are considered segments of the same category. This gives the desired result, that specifiers can be included in the theory. But the definition remains restrictive enough to exclude more than one specifier. Adjunctions to maximal projections are excluded.

The only adjunction that is included into the theory is head to head adjunction.

We thus get the following restrictions to X-Bar theory:

a) Projections have one and only one head.
b) They have at most one complement and this is a right sister of the head.
c) They have at most one specifier and this is a left sister to the node dominating the head.
Hilda Koopman mainly adopts Kayne's definition of antisymmetric syntax apart from his distinction between categories and segments. She solves the specifier problem in another way: She proposes, that there can be no overt material in the head and the specifier of the same projection. With this she states her modified LCA:

\[
\text{Segments participate in c-command.}
\]

\[
\text{Modified LCA: the linear order of overt terminal elements corresponds to asymmetric c-command.}
\]

(Koopman (2000,338))

This approach seems to me to have two technical problems. First it doesn't permit movement to a specifier of a specifier and second, more problematic, we don't get asymmetric c-command of a specifier over a complement.

Take the following configuration:

\[
\text{ZP asymmetrically c-commands YP. This means y has to follow z. But X' also asymmetrically c-commands Z. Therefore z has to follow y. We arrive at a contradiction. Note, that this contradiction is independent whether the head of XP is filled or not. But the proposal, not allowing overt material in the specifier and the head at the same time is interesting by itself. I will return to it when discussing the ways to implement morphology in syntax.}
\]

What is important here is the empirical reason Koopman gives for this assumption. In fact it is a generalisation of the Doubly Filled Comp Filter, a rule that doesn't permit overt elements in the spec of the CP together with overt material in its head. In Haegeman (1994,423) we find the following definition:

\[
\text{When an overt wh-phrase occupies the Spec of some CP, the head of that CP must not dominate an overt complementizer.}
\]

It seems that similar restrictions hold for many operators assumed to be in the CP. The alleged exceptions can, according to Koopman, be explained by taking recourse to a Split CP
model (e.g. Rizzi (1997)). She showed clearly that instead of taking the two elements in consideration as spec and head of the same projection it seems more plausible to assume them sitting in different projections. One example from many that she gives in Dutch shall suffice here:

\[
\text{Ik vraag me af wie of dat er morgen komt}
\]

I wonder who if that there tomorrow comes

(Koopman (2000,342)

The three elements in question "wie", "of" and "dat" can of course not be in one and the same projection. According to Koopman's analysis we have to deal with three projections in the split CP. "wie" sits in the spec of a WH-projection, "of" in the head of a Q projection and "dat" is the head of a CP.

In Sportiche (1993) we find a generalization of the Doubly Filled Comp Filter for clitic projections which he calls voice projections:

\[
\text{...Suppose that just as the Clitic Criterion suggests a generalization of the WH-criterion to a more general principle of licensing ... the doubly filled COMP filter generalizes in such a way that it covers Clitic projections or Voices as well. The general idea might be that functional heads such as certain Cs or certain Clitics cannot be simultaneously filled as their specifier if they encode a property overtly realized on the specifier...}
\]

(Sportiche(1993,32))

While the minimalist program tends via economy principles, to minimize projections, the antisymmetric framework ends up postulating more structure. But this apparent disadvantage is balanced by the much simpler and more uniform description of phrase and sentence structure.

In the meantime new observations in the fields of argument structure and modifier status gave new impetus to syntactic theory.

### 1.7 Argument Structure and VP shell

The first problems arose in the field of arguments. Ever since the restriction to totally binary structure of syntactic trees was accepted, it was unclear how to deal with ditransitive structures. There was only one complement position available for two internal arguments. Larson gave an interesting answer to this problem in Larson (1988) with his VP shell hypothesis. Instead of having only one single projection associated with the verb, he assumed that there were two; one (the lower) headed by the full verb and the other by a so called light verb, which could be overt like the Italian "fare" in causative constructions like:

\[
ti lo faccio vedere
\]

you_DAT it-ACC CAUS see

'I show it to you'

or covert as in the English equivalent. This structure gives enough room to host all internal arguments of the verb. The direct object sits in the complement position of the full verb and the indirect object in its specifier position.
Together with the VP-internal subject hypothesis we have all arguments of the verb base generated in a very local relation to its predicate:

\[
\begin{align*}
&v_P \\
&  \text{Subject} \\
&  \quad v' \\
&  \quad \quad v \\
&  \quad \quad \quad v_P \\
&  \quad \quad \quad \quad \quad v' \\
&  \quad \quad \quad \quad \quad \quad v \\
&  \quad \quad \quad \quad \quad \quad \quad \quad \text{OBJ}_{\text{ind}} \\
&  \quad \quad \quad \quad \quad \quad \quad \quad \quad \text{VP} \\
&  \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \text{OBJ}_{\text{dir}} \\
&  \quad \ quad
Independent of the exact realisation, this seems highly implausible, since we know that arguments have to be allowed to move out of their base position. Most modern syntactic theories try to avoid movements out of spec positions for independent reasons. The only admissible position out of which movement sometimes is allowed is the highest internal specifier. But even if we allow for internal movements to this position before extraction, we could extract only one argument and move it to a higher position in the tree. That this can’t be enough in general can be shown by examples of wh-fronting of two arguments e.g. in Polish:

\[
\begin{align*}
\text{Kto} & \quad \text{co} & \quad \text{robi} \ ? \\
\text{Who} & \quad \text{what} & \quad \text{does} \\
\& \quad \text{Who} & \quad \text{does} & \quad \text{what} ?
\end{align*}
\]

(Haegeman (1994,504))

This one example should suffice to show that the above structure does not seem to be the correct one. It remains to posit all arguments in spec positions. The simplest way to achieve this would be to add a single projection to Larson’s VP shell, removing the direct object from complement position and putting it in the spec position of the newly inserted phrase:

\[
\begin{align*}
\text{This partial syntactic tree presents a model totally symmetric in all arguments with only a rising degree of connectedness with the verb from direct object to subject in accordance with cross-linguistic syntactic observations.}
\end{align*}
\]

If we look on the other side for a possible model, which posits both objects in analogous positions, but the subject in another we have a priori two possibilities:

a) The objects sit both in complement positions, the subject in a specifier
b) The subject occupies a complement position; the objects are in specifiers.

Solution a) can be excluded for the same reasons as shown above by rejecting all three arguments in complement positions.
If we concentrate on the second solution the only possible model corresponds to reversed Larsonian shells: the subject is the complement of the verb and both objects are in specs:
But this gives us the undesirable constituent V-Subject.
To me, the total symmetric structure with all arguments sitting in specifier positions seems to be the only solution if we want to maintain the assumption, that all arguments are base generated in local relation to the verb (in a kind of "VP shell") and if we want to have X-Bar relations correlated to semantics.
A predicate with more than one argument (e.g. with n arguments) would then be represented by a shell of n+1 projections, where the lowest hosts in its head the predicate and the higher the arguments in spec positions.

1.8 Semantic Interpretation of X-bar Structure – The Proposal of Barbiers

The idea of interpreting X-Bar directly in semantic terms is not entirely new. Barbiers presents in his dissertation an interesting proposal concerning a relation between syntax and semantics. With reference to economy principles of the minimalist program he writes:

*There is one property of current generative syntactic theory that makes it particularly uneconomical, namely the fact that X-Bar structure itself does not contribute to the semantic interpretation.*

(Barbiers (1995, 2)

To establish a possible link between syntactic and semantic relations he considers two options:

a) a direct link between a syntactic relation R that holds between two nodes X and Y and a semantic relation S holding between X and Y
b) a separate node R which expresses this semantic relation

Barbiers considers the second option to be more economical and chooses it. He takes relations of the type relation R relates element X to element Y to be the principal ones. Since three constituents are involved, namely the relation and the two elements, he calls them ternary. Relations between lexical items and their modifiers, e.g. nouns and adjectives or VP and adjunct PPs are in his framework ternary relations reduced to binary relations via movement.

Formally he expresses these ideas in the

**Principle of Semantic Interpretation (PSI)**

I. A node Z establishes a S(emantic)-Relation between a node X and a node Y iff X immediately c-commands Z and Z immediately c-commands Y.

II. A node Z is a Qualifier of a node X iff Z establishes a S(emantic)-Relation between X and Y, and X and Y are coindexed.

(Barbiers (1995,7)
He illustrates his proposal with the example of the relation of "John" being "after" "Mary", which could be expressed by the following PP:

```
    PP*
   /   \
  PP    \\
    /   \\
   P    DP_2
   |     |
John  after  Mary
```

So it is the intervening head "after" which determines the relation between the two DPs. But since "after" is an asymmetrical relation there is missing, according to Barbiers, a second relation which could be paraphrased as "... and John is after". To see how this could be implemented, let's first have a look at a typical "qualification" relation like "the old man" where "old" is the qualifier of "the man". Since there is only one DP involved it has to occupy both positions that are related by the qualifier:

```
    PP*
   /   \
  PP    \\
    /   \\
   P    DP_2
   |     |
the man_1 old_2 ti_1
```

This means for our "John after Mary" example that the missing relation "...and John is after" has also to be expressed via movement:

```
    AgrP*
   /   \
  AgrP    \\
    /   \\
   PP*    PP
   /   \\    /   \\
  PP    Agr_2 P_j     Agr_1 ti_j
   |     |     |        |
John  after  Mary  
```

Note that the Agr node has the same index as the moved DP via spec head agreement.

Though the idea behind this proposal to relate X-Bar structure to semantic relations seems to me to be a milestone, it is surprising that Barbiers rejects the first option of relating directly the relation between two syntactic nodes to semantic relations. The introduction of the
intervening node with lexical content, constrains the model to express only relations defined by lexical items. In my opinion, it would be more minimalist to express directly X-Bar relations with semantic terms as for example Spec-Head relations relate to argument-predicate relations.

But if we restrict ourselves to antisymmetric structure, there are not many syntactic relations available: specifier-head, head-complement and specifier complement. If we are looking for syntactic equivalents for predicate-argument relations we encounter the problem of predicates with more than one argument. A ditransitive predicate as "give" is commonly assumed to have three arguments: the donator, the gift and the goal. Since we have only one specifier for every head we cannot simply put all three arguments in the specifier of the head node above the verb. There are two possible options:

One possibility is to view a sentence like "John gives a book to Anne" as compounded of three predications. The innermost consists of the predicate "give" which has only one argument slot for the gift. Here we can put the verb in the head and the argument in its specifier. Then these two build up the complex predicate "to give a book" which in turn has again only one argument, the goal. "to give a book" is a maximal projection which sits in the complement of an empty head and the goal "Anne" in its specifier. Together they build the maximal projection "to give a book to Anne" which can be viewed as the one slot predicate with the donator "John" being its single argument. Again the predicate is in the complement of an empty head and the argument in the specifier. This would give us as generalisation both syntactic relations "specifier-head" and "specifier-complement" as realisations of a "argument-predicate" relation.

The other option is to enlighten the condition of taking only strictly local syntactic relations inside one maximal projection. We could view the verb "give" as having three arguments. It sits in the head of the lowest projections. All arguments (respecting an order dictated by syntax and/or lexical entry of "give") sit in specifiers of projections above. But this would imply a kind of superstructure composed of more than one projection. Its lowest projection bears the predicate in its head. The number of projections is given by the number of arguments. Predicate-argument relations are realised as relations between specifiers and the lowest head. I will return to this idea in the chapter about prepositional phrases and movement. There I will present an analogous structure for PPs above the VO, which I developed for independent reasons.

1.9 Parallels between Morphology and Syntax – The Mirror Principle

In 1985 in the famous article referred to as "The Mirror Principle" (Baker(1985)) Baker described striking parallels between syntactic derivations and orders of certain morphemes of the main verb. What these morphemes have in common is that they are all involved in changing the valency of the verb. Passive morphemes render a transitive verb intransitive; the original object becomes the subject. The former subject gets oblique case and is optional. Modifying DPs, usually expressed as PPs become ordinary objects via applicatives and causatives add a new argument as principal subject.

There is another property of these morphemes that distinguishes them from ordinary derivative and inflective morphemes like mode, tense and aspect: they do not have a rigid ordering among each other, as an example from Quechua exemplifies:

Maqa-nak-ya-chi-n
beat-recip-dur-caus-3S
"He is causing them, to beat each other,\"
Maqa-chi-naku-rka-n
beat-caus-recip-pl-3S
'They let someone beat each other.'

(Baker (1985,374f))

In the first example the reciprocal marker is closer to the root than the causative marker. Therefore Baker assumes that the reciprocal is attached prior to the causative. This corresponds to the order of syntactic derivations which first identify Subject and Object of the verb "beat" before adding a causer to the event. In the second example the reciprocal is attached to the verb after the causative. The interpretation makes clear that the corresponding syntactic derivation first adds a causer and then identifies causer and object.

This idea has consequences for the theory of the organisation of the grammar. Morphology and Syntax cannot be viewed as entirely independent. Somehow it has to be explained why and how syntactic derivations reflect morphological ones. If we take verbs as entering the numeration totally inflected with all affixes, we have to stipulate somehow that the internal order of the morphemes is transparent for the syntactic process.

1.10 The Cinque Hierarchy

A milestone in the field of modifier syntax is the contribution of G. Cinque in Cinque (1999). He assembles a large amount of data from a great number of languages which helps to view the syntax of certain types of modifiers in a totally different light. He starts with the observation that adverbs can be grouped in different types which respect among themselves, a rigid order. Thus only one of the following word orders is possible:

Ha solitamente sempre ragione lui.
'He is usually always right.'

* Ha sempre solitamente ragione lui.
'He is always usually right'

Gianni ha sempre completamente perso la testa per lei
'Gianni has always completely lost his mind for her'

* Gianni ha completamente sempre perso la testa per lei
'Gianni has completely always lost his mind for her'

(Cinque(1999,6f))

In English the second order is also at least very odd, as the translations show. In French we find the same pattern:

C'est lui qui a généralement toujours raison
'It's him who is usually always right'

* C'est lui qui a toujours généralement raison
'It's him who is always usually right'
Expanding the corpus to many other adverb types and comparing this with data from totally different languages such as Norwegian, Chinese and Hebrew, he arrives at the conclusion that these types of adverbs are rigidly ordered in all sentence types in all languages.

In a similar way he discovered a universal hierarchy of agglutinating affixes. In all languages with agglutinative suffixes we find epistemic morphemes to the right of tense morphemes and the latter to the right of aspect morphemes. For prefixes we get two patterns: either the opposite order of the suffix order (by far the pattern found most) or the same order (rarely found, e.g. in Navajo).

But the most surprising discovery was his observation that between groups of adverbs and each type of affixes a semantic one to one relation could be established which gives us the exact mirror order of the adverbs for the suffixes.

Combining the two orders (one filling gaps of the other) he derives the universal hierarchy of modifier types:

- **Mood**
  - speech act
  - evaluative
  - evidential
  - epistemic
- **T (Past)**
- **T (Future)**
- **Mood**
  - periphrastic
- **Mod**
  - necessity
  - possibility
  - volition
  - obligation
  - ability, permission
- **Aspect**
  - habitual
  - repetitive I
  - frequentative I
  - celarative I
- **T (Anterior)**
  - terminative
  - continuative
  - perfect
  - retrospective
  - proximative
  - durative
  - generic/progressive
  - prospective
- **Aspect**
  - SgCompleitive I
  - PlCompleitive
- **Voice**
  - well
  - fast, early

(Cinque (1999,106))

This discovery opens up the discussion on modifier structure and the old adjunction model could not serve any more.

As described above, adjunction is a free process, unordered and unlimited. But Cinque's data revealed a rigid order, which could not be explained via adjunction.
Furthermore adjunction is incompatible with Kayne's antisymmetric model of syntax. So three questions arise:

- How to account for the rigid order of adverbs?
- How to account for the rigid order of affixes?
- How to account for the relation between the two orders?

Cinque's answer to these questions is ingenious and simple: he extends Pollock's split-Infl region to a hierarchy of functional projection between the CP layer and the VP shell. Each functional projection corresponds to one of the above modifier types. Affixes are seated in the heads of the prevailing projection, adverbs in their specifiers. Note that adverbs cannot simply be heads, but must be part of their own projection, since they can be modified by other adverbs and degree expressions without changing the ordering relations:

Hans hat oft schnell aufgegeben.
'Hans has often quickly given up.'

?? Hans hat schnell oft aufgegeben.

Hans hat sehr oft wirklich schnell aufgegeben.
Hans has very often really quickly given up.

?? Hans hat wirklich schnell sehr oft aufgegeben.

(The sentences marked with "??" become possible with a very marked intonation and correlated topic-focus structure with the celerative AdvP in some kind of topic position and the frequentive AdvP in some kind of focus position). Being a full XP the head position is not available for the AdvPs. Cinque supports the Adv in Spec hypothesis with data from verb movements in Italian.

If we think back to former analysis of IP or in the Pollock framework, we remember that not only affixes were hosted in the functional heads but also certain auxiliaries. If we are going to expand the split Infl region to the Cinque hierarchy we should expect a corresponding hierarchy of auxiliaries as well. And indeed Cinque shows, that e.g. in English and Spanish we can find this corresponding order:

These books have been being read all year
Esos libros han estado siendo leídos todo el año

(Cinque(1999,57))

where the three auxiliaries reveal the order Tense > Aspect_{perfect} > Aspect_{progressive} > Voice in accordance with the Cinque Hierarchy.

In recent work (Cinque (2000)) he expands the analysis to include certain verbs in Italian that take infinitival complements and permit clitic climbing like "volere" (to want), "finire" (to end) and "venire" (to come), called restructuring verbs. He claims that these verbs are base generated in functional heads just like auxiliaries such as "be" and "have". By doing so he manages to explain their otherwise exceptional behaviour.

An interesting aspect is the way Kaynian antisymmetry and linear order of adverbs follow from each other. We have seen that adjunction, which would give us free order, is excluded from syntax by the antisymmetric model. On the other side the overall data shows that the
languages of the world have an inherent antisymmetry with respect to adverb order: In a symmetric world (with respect to the head parameter), we would expect both languages with adverb order of the Cinque type (mode before tense before aspect), and languages of the reversed type (aspect before tense before mode).

In fact, there seem to be a small sample of VO languages like Malagasy, Tzotzil and Zapotec which show reversed order. In Pearson(2000,330f) we find the following examples:

Jean lave toujours bien ses vêtements (French)  
Jean washes always well his clothes  
'John always washes his clothes well'

Manasa tsara ny lambany foana i Ketaka (Malagasy)  
wash well DET clothes.3 always DET Ketaka  
'Ketaka always washes his clothes well'

Pearson distinguishes two types of VO languages: one that behaves like French, having the direct order of adverbs and the other (probably much smaller group) with inverse order. OV languages seem to exhibit always the direct order. This is certainly not a symmetric pattern. Given that many languages with direct order have partial verb climbing and the described examples are all verb initial, we might arrive at the conclusion that adverbs exhibit the pattern:

Adverbs before the verb appear always in direct order, adverbs behind the verb either in direct or in inverted order

But before having a closer look at the sample of languages with inverted order this generalisation should be handled with care. It is tempting to accept it since it would be in perfect analogy with patterns we find with Noun-Adjective and Verb-PP orders. If it turns out to be correct, a symmetric analysis will have difficulty explaining why we never find languages with reverse order before the verb. It is in this way that the typological distribution of adverb order confirms the antisymmetric hypothesis.

1.11 Recent Minimalist Developments

Recently Chomsky made some major changes to the Minimalist Program in Chomsky (1998), Chomsky (1999) and Chomsky (2000). Though he is mainly concerned with the core system of main predicate, arguments and agreement, he gives some remarks on modifier syntax (Chomsky (2000)).

Movement in this variant of minimalism is still triggered by the deletion of uninterpretable features. Elements with these features that cannot be interpreted at the level of LF are called probes. They search in their c-command area for elements with matching features which are called goals. If they find them they establish a so-called Agree – Relation.

In most cases the probe has an additional OCC feature (which replaces the former EPP feature), which provides an extra specifier position (and here we find a major difference with Kayne's system that allows for only one specifier) that has to be filled. This can happen via (external) Merge with an already constructed external constituent like an expletive (e.g. English "it" or "there") or via Move (internal Merge), where the agreeing element is attracted to this position. What is important for our purpose is the possibility that the agreeing element in certain cases does not have to move to the probe. "Agree" in this framework is not an inherent part of "Move".
But Chomsky does not extend noun-verb agreement system to other realms of verbal inflection. (One could think of the functional heads that correspond to the Cinque hierarchy, as bearing uninterpretable features which trigger verb movement).
Moreover he speculates that V-raising itself is not part of narrow syntax:

The account so far leaves open the possibility that V-raising is comparable to TH/EX and DISL: not part of the narrow-syntactic computation but rather an operation of the phonological component.

(Chomsky (1999,30))

If this is true for Verb-raising then we could easily generalize this to eliminate head movement completely.

In Chomsky (2000) he addresses the problems of modifier syntax. While clinging on to the idea of adjunction which he considers to be an obstacle to syntactic theory at least up to now

"There has never, to my knowledge, been a really satisfactory theory of adjunction,..."

(Chomsky (2000,15)).

he tries to overcome these obstacles and open up a window to integrate adjuncts into his framework. But in order to permit this he introduces a new mechanism, called "late merge", which means that the adjunct can be merged to the element it modifies, after the latter has been moved, and this even in a non cyclic way.
Since in this version of minimalism there is clearly no mechanism available to explain the rigid order of adverbs and their correspondence to the order of affixes, I will remain in the following in the (antisymmetric) framework of Cinque. First I want to go deeper into morphology and show how one could explain the difference between prefixes and suffixes in a purely syntactic approach in Chapter 2 before extending the idea of a hierarchy of modifiers to the realm of prepositions. In Chapter 3 I try to show that we can indeed establish an ordering between prepositional expressions with the example of German. In Chapter 4 I try to explain how to derive the different surface orders in German, English and Dutch.
2 Restrictions of Structure and Movement

2.1 Introduction

The first attempts of Generative Grammar resulted in systems that could generate all possible grammatical sentences of a language but unfortunately were more powerful than expected because they could generate an infinite number of ungrammatical sentences and structures that were never found in human languages. Subsequent models tried to define a more restrictive theory, which could derive all possible grammatical sentences of a language, but exclude the ungrammatical ones. One of the major goals was to restrict theory in a plausible manner.

Since the early GB framework it is commonly assumed amongst generativists that the structure of sentences can be modelled using binary trees. These are collections of nodes and relations between them that are all connected and have a final root node, the sentence node that dominates the whole structure.

In the 90s two recent developments modify this approach. The minimalist program by Chomsky replaces the levels of DS and SS with a dynamic, derivational approach, which starts with a set of lexical items that are put together by the computational system of the language faculty in a highly unified way. At the end we still get two representational levels, LF and PF, which are passed over to the conceptual-intentional and the sensor-motoric interface. The initial set, the numeration, consists of all lexical and functional elements in their fully inflected forms which build up the sentence. They form the basic constituents for the derivational process, which mainly consists of the merging of two such constituents thus creating a new one. This new constituent can be merged with others, either basic or complex ones, which are already the result of a computational process. The transformational component is introduced by allowing a complex constituent to be merged with a sub component of its own, a process which is commonly called Move. The inclusiveness principle (which excludes the introduction of new elements during the derivation) and economical considerations build strict restrictions on this derivational process.

The second principal modification that enters the discussion of Generative Grammar is Kayne's antisymmetrical approach. He starts with the observation that a free head parameter would lead to symmetric variations of word orders among languages, which we actually do not find.

These observations lead him to define certain restrictions on the structure of trees. He relates linear word order to hierarchical dominance relations in a surprisingly simple way that lead to restrictions of constituent structure, which are identical to the common left headed X-bar structures. In particular we get the restriction, that every XP is headed by exactly one and only one head (which, in his approach, could be made complex by head movement), at most one complement which – if existent- is a right sister of the head and at most one specifier which – if existent – is the left sister of the X' node which directly dominates the head (and a potential complement). A principled difference with respect to Chomsky's minimalist approach is the exclusion of more than one specifier, which is crucial for Chomsky's system.

In all variants of Transformational Generative Grammar, it is the head that determines the category and the behaviour of its projection. Lexical selection restrictions of the head determine, whether it has a complement or not, and if so, these restrictions determine some of the semantic and syntactic properties of this complement. Thus, "love" selects either an infinitival clause or a noun phrase. In case of a noun phrase it has to have the feature [+hum] (human). But note that semantic restrictions are
not so strict: you can "love a pet", or "love this kind of music" or "love Venice", but at least it assigns a theta role to the object.

The role of the specifier is less clear. During the history of Generative Grammar, different constituents were associated with it. In early times auxiliaries were assumed to be in the specifier of verbs, determiners in the specifier of nouns. Both ideas were abandoned later. Longer lasting was the idea, that specifiers host subjects, though even this is much debated lately.

GB theories demand moved elements to C-command their traces. This excludes complements from the set of possible landing positions, since these would never C-command their traces. This gives us specifiers as the only landing positions for full XPs. In early GB the transformational component mainly consisted of "move alpha", a rule that allowed every component (heads or XPs) to move freely to any landing position, if not forbidden by some other principle. This freedom allows every specifier to become a landing position for a full phrase. Head movement to a specifier position is excluded by structure preserving principles as well as antisymmetric considerations.

In minimalist theories the existence of a specifier is entirely determined by the head. Specifiers of lexical heads are demanded by their argument structure. Specifiers of functional heads are needed for checking reasons. If the functional head has an uninterpretable feature that has to be cancelled (early versions), it attracts overt material.

Another operation that we find in the minimalist framework is adjunction of a maximal projection XP to another maximal projection YP. It expresses modification of YP by XP without changing neither the categorial status of the YP nor its general semantic interpretation. The antisymmetric framework allows only one adjunction to a maximal projection which could be identified with the only specifier.

Adjunction of a head X to a head Y, on the other side, exists even in Kayne's model. It is usually assumed to be responsible for movement of lexical heads to get their affixes assigned or in a minimalist view to check their (morphological) features. This movement seems to be restricted by the head movement constraint (HMC) which prohibits to skip intervening heads. While minimalism tries to search for the most economical implementation of a language device, antisymmetry gave us a theory with highly restricted bare phrase structure. In this chapter I want to give an overview of possible restrictions on structure and movement. I will start with the presentation of a new formalisation of antisymmetric syntax, which is slightly more restrictive than Kayne's original proposal. Then I want to show what kind of restrictions on movement we might expect. Finally I will add a very superficial discussion about possible parameters that could distinguish languages.

### 2.2 Trees and Subtrees

In the following I will assume, that syntax is antisymmetric. This means that the sentence can be represented by a tree structure consists of atomic substructures of maximal projections which have

- obligatorily a (overt or covert) head as a defining element,
- optionally one (and only one) specifier and
- optionally one (and only one) complement position.

Specifiers and complements can (recursively) host other maximal projections.

For the moment, I will ignore the possibility of head adjunction, which raises unwanted complications. This can be represented as:
I am interested here only in the minimal structure, consisting of the head, the two segments of the maximal projection and the potential edges to the specifier and the complement. These structures are fully determined by their head. Additionally I am interested in the connection of this substructure to the rest of the tree. If it not the root of the structure, this projection sits either in the specifier or the complement of another projection, which is defined by its head Y. Thus the whole tree structure can be fully determined by two sets: the set of all heads and a set of relations R between these heads.

This relation R will be defined as a set of triples R(X, Y, Rel) where Rel could be either "Spec" or "Comp". If Rel is "Spec", XP sits in the specifier of YP, if Rel is "Comp", XP is in the complement of YP. For example, the notation R(D, I, Spec) is an abbreviation for the configuration of a DP (projection defined by D) sitting in the specifier of an IP (projection defined by I).

If we exclude the root from the description of a tree, there are two restrictions to the relation R:

1. There will be for each head X exactly one triple R(X, Y, Rel) with this head in first position (every projection is in the specifier or complement of another).
2. There is at most one entry with a head in second position with the relation Rel = Spec and at most one with the relation Rel = Comp (there is only one specifier and one complement if at all).

The first condition states that we could rewrite the relation R as a function Link with a single argument of heads and an image of a pair consisting of another head and a relation: Link(X) = (Y, Rel). Our example from above would be stated in this formulation: Link(D) = (I, Spec).

To include the root, which, by definition, is not located in the specifier or complement of some other projection, I add the reflexive relation NULL, which is only defined on the root node. We define for the root node A: R(A, A, NULL) or in functional notation Link(A) = (A, NULL).

Thus, we get the definition:

**DEF:**

A tree is a set H of different heads together with a total function Link: H → H x {Spec, Comp, NULL} on this set with exactly one head A ∈ H with Link(A) = (A, NULL), where A represents the sentence.

The function Link: H → H x {Spec, Comp, NULL} is defined on the whole set of heads H with the properties:

a) NULL is reflexive, i.e. for every A, B ∈ H if Link(A) = (B, NULL) then A = B
b) Spec is injective, i.e. for every A, B, C ∈ H if Link(A) = (C, Spec) and Link(B) = (C, Spec) then A = B
c) Comp is injective, i.e. for every A, B, C ∈ H if Link(A) = (C, Comp) and Link(B) = (C, Comp) then A = B
H is the set of non-terminal, non-splitting elements, i.e. the categories that we find in head position of the tree. It is possible to have several heads of the same category in the set, in this case they should be distinguished by subscripts: \(D_1, D_2, D_3\) etc.

As is well known from the earliest linguistics research, human languages seem to reveal several hierarchically ordered levels between the full sentence and the single word. A transitive sentence consists of a subject DP and a VP. The VP is furthermore subdivided into Verb and Object DP. Each DP consists of at least a determiner and a NP. Correspondingly, the theory should be concerned with substructures of a tree, subtrees:

```
DEF:
A connected subtree of a given tree \{H, Link\} is a set \(S \subseteq H\) of different heads together with the total function \(Link/S: S \rightarrow S \times \{\text{Spec, Comp, NULL}\}\) on this set with exactly one head \(B \in S\) with \(Link(B) = (B, \text{NULL})\). (Link/S means the restriction of the total function Link to the subset S).
```

But we cannot be sure that the relevant structures we are interested in are connected in all cases. It could be that relevant constituents of the sentence start out as different parts scattered around the basic structure of a tree and only come together during the later derivation. For generality I will add the definition:

```
DEF:
A (generalised) subtree G is the union of connected subtrees \(S_i\).
```

### 2.3 Basic Projections

Thus a subtree, formally consisting of a set of heads together with a function, which relates every head to another one, is different from the notion of phrase. For each head (except root heads) the relation defines how its maximal projection is linked to the rest. In this picture the most natural basic building blocks of sentences are not pure heads but heads with structure: the smallest subtree is one with only one head \(X\), projecting an \(X''\) including possibly (empty) edges to specifier and complements without any connection to another projection:

```
X''
\---\---\---\---
X''
\---\---\---\---
X
```

I will call this atomic subtree "Basic Projection":

```
DEF:
A basic projection is a subtree with only one single head.
```

Besides their phonetic and semantic content, words in the lexicon also have syntactic information. They are assumed to have certain selectional properties, which dictate whether they need a complement and in that case certain semantic and syntactic restrictions on this
complement. Furthermore, many generative theories assume that they have information about their need of having overt material in their specifier. Thus the identification of heads with a basic projection seems to come out right natural. Whether a basic projection has a specifier and/or a complement is dictated by lexical information of the head. In the case of having no specifier and no complement the X-head can be directly identified with the basic projection. In the case of having a complement but no specifier the basic projection consists of a head, a mother node X'' and an edge to a complement. These identifications are close to Chomsky's definition of bare phrase structure.

This gives us the following basic projections as lexical entries:

a) only head

\[ X'' = X \]

b) head and complement

\[ X'' \quad X' \]

c) head and specifier

\[ X'' \quad X'' \quad X \]

d) Head, specifier and complement

\[ X'' \quad X'' \quad X \]

In the following I will use only basic projections with all branches (case d), but it should be kept in mind that this is only an abbreviation. For real cases it has to be substituted by one of the above trees.

To express the difference between phrases and maximal nodes of a basic projection I used the notation X'' (two bars were added for convenience, certainly there doesn’t exist any intermediate X'-level in an antisymmetric structure anymore). So X'' is just the name of the (doubled) highest node whereas XP also subsumes the complete structure below including all material iteratively found under specifiers and complements.

Whether to include the edges of possible specifiers and complements into a basic projection is arbitrary. In most mathematical definitions of trees edges are always connecting two nodes. In this sense these edges have to be excluded from the structure because specifiers and complements don’t need to be filled in every basic projection (otherwise we would have
infinite recursion). But if we just view them as possible links to other atoms we can include them and in the following I will do so.

In contrast to basic projections, XPs are complete phrases made up of all the material under the highest node including all the stuff that is found under the specifiers and complements including insertion of all lexical material. Formally they are subtrees of a tree which include all the heads that are dominated be the highest node. (Domination defined in the usual way). VP (in the traditional interpretation) is an atomic subtree over V together with DP (- phrases) linked to specifier and complement position:

```
           V'
          /
         DP
        /
       X    D
```

**DEF:**
A phrase XP is a connected subtree \{S, Link/S\} of a tree \{H, Link\} where for every head A, B ∈ H with Link(A) = (B, Spec) or Link(A) = (B, Comp) and B ∈ S, also A ∈ S.

### 2.4 Basic Relations

We have to redefine the basic relations like domination and sisterhood according to the new picture, since we don’t have any more nodes and edges. The relation of sisterhood doesn’t make much sense anymore. This seems to be at first sight unwanted. We have been used to thinking in these terms for a long time. But do we really need it, so that the relation between specifier and X’ turn out to be the same as the one between head and complement? The LCA dictates an antisymmetric structure which contradicts a symmetry of sister nodes. Thus our basic relations as defined by the definition of trees are **specifiers** and **complements**. But we haven’t expressed the antisymmetry yet. So far the structure of the basic projection looks very symmetric: there is an open link to the left and one to the right. We could express it thus by the equivalent symbol:

```
X'' ≈
  /
X''  x
  /
  x
```

But this structure is too symmetrical! Specifiers are not in the same relationship to heads! So we need at least the relationship of C-command between them to differentiate.

As a reminder, here is again the definition of Kayne(1994,16):

\[ X \text{ C-commands } Y \text{ iff } X \text{ and } Y \text{ are categories and } X \text{ excludes } Y \text{ and every category that dominates } X \text{ dominates } Y \]

Thus, specifiers clearly C-command heads and heads C-command complements and everything dominated by them. Specifiers of specifiers C-command the same head as well. This gives us the required transitivity: If one basic projection C-commands another one it C-commands those commanded by the latter as well.
To achieve a correct definition of C-command I have taken recourse to the notion of domination, which serves no other purpose. Because I identify heads with their projections I want to have in the dominance not only the specifier and the complement, but also the basic projection itself:

**DEF:**
A basic projection A **dominates** a basic projection B of the same tree \{H, Link\} iff
a) Link(B) = (A, Spec)
or
b) Link(B) = (A, Comp)
or
c) B = A
or
c) there is another basic projection C of \{H, Link\} with A dominates C and C dominates B

Note that I included the identity relation in the domination thus making it reflexive. A basic projection always dominates itself.
A special case of domination is the immediate dominance relation.

**DEF:**
A basic projection A immediately dominates a basic projection B of the same tree \{H, Link\} iff
a) Link(B) = (A, Spec)
or
b) Link(B) = (A, Comp)
or
c) B = A

**DEF:**
A basic projection A (antisymmetrically) C-commands a basic projection B of the same tree \{H, Link\} iff
a) Link(A) = (B, Spec)
or
b) there is a basic projection C with Link(C) = (A, Comp) and B is dominated by C
or
c) there is another basic projection C of \{H, Link\} with A C-commands C and C commands B

In fact, it is this definition of C-command that renders the tree structure antisymmetric and thus should be part of the definition of an antisymmetric tree.

The following complex relations will be needed in the course of this chapter:

**DEF:**
A **right branch** of a maximal projection X’’’ is the phrase headed by the complement of X.
A basic projection B belongs to the **straight right branch** of a maximal projection X’’’ iff there is a basic projection A belonging to the same straight right branch and Link(B) = (A, Comp).
A **left branch** of a maximal projection X’’’ is the phrase headed by the specifier of X.
A basic projection $B$ belongs to the **straight left branch** of a maximal projection $X''$ iff there is a basic projection $A$ belonging to the same straight left branch and $\text{Link}(B) = (A, \text{Spec})$.

That means that a straight right branch is a sequence of projections connected by a straight complementiser line:

![Straight Right Branch Diagram]

whereas a straight left branch a collection of basic projection along a specifier line is:

![Straight Left Branch Diagram]

With these definitions we can also express in a formal way the main skeleton of the sentence, the line leading down from CP over IP to the VP.

**DEF.**

The **main projection line** (MPL) is the straight right branch of CP.

### 2.5 Extended Projections

Traditionally, phrases are viewed as structures of intermediate level situated between sentence and word. In the simplest picture a basic sentence consists of NP and VP, the latter being made up of Verb and optionally another NP. But very soon linguists had to add the functional projections IP where auxiliaries or inflections should be situated and CP, responsible for introducing dependent clauses, above the VP to explain linguistic data. Pollock split the IP
further into a Tense Phrase, TP, and an Agreement Phrase, AP. It became common to view
the new functional projections as building an “extended projection” of V.
Abney renewed the traditional view of the nominal projection (Abney(1987)). Up to his time
determiners were viewed as specifiers in the maximal projection of a nominal head. He
showed that taking them as heads with their own projection DP, selecting for the nominal NP
as complement, could explain more data than the old view. Soon his DP-hypotheses was
widely adopted. In analogy to the CP as extended VP, the DP could be analysed as the
extended projection of N. Bittner and Hale added a second functional projection above the
DP, responsible for assigning case, which they called KP (Bittner, Hale (1995)). This
completed this analogy.
In the last decade much work has been done to explicitly describe the structure of extended
projections. Nouns can be modified by quite a number of different elements, like adjectives,
numerals, qualifiers and demonstratives, which have to be situated in a rich structure with
many functional projections above the N, especially when adopting Kayne’s antisymmetric
framework. For the whole sentence, Cinque proposed an extremely rich structure with a
hierarchy of over 30 functional projections above the VP, which might be seen as an extended
projection of the verb. Rizzi showed that the sentence part, usually called CP, has a much
richer structure than assumed in earlier works. Further research (Koopman) showed, that even
for prepositions we have to adopt richer structure to account for many elements that come
(optionally?) with prepositions like degree elements (“right over the bridge”). Kayne’s recent
work regarding prepositions has a structure with two maximal projections, with one being in
the complement of the other.
As such, extended projections play an increasing role in modern generative grammar,
particularly when adopting Kayne’s LCA. But to define them precisely seems to be extremely
difficult.
At least for the verbal extended projection we can distinguish three different parts or layers:
- The predication layer where predicate (verb) and arguments are inserted in certain local
  relationship: the VP shell, where we could take arguments as sitting in specifier positions C-
  commanding their predicate.
- The modifier layer with adverbs, PPs, modifying affixes and modals which make up the
  Cinque Hierarchy and replace the old (split) IP.
- The "pragmatic" layer with positions regarding the interlocutory force and the information
  packaging (focus, topic), Rizzi’s split CP.
Analogous subdivisions can be made for the DP as extended projection of N. For example:

L’invasione italiana dell’Albania
'The Italian invasion of Albania'

The adjective "Italian" and the Genitive DP "of Albania" express the subject and the object of
the underlying verb. In addition we have a layer with modifying adjectives and PPs.
Demonstratives and determiners finally have more pragmatic value in assigning referential,
deictic and (text-) anaphoric properties to the noun.
Modifiers like adverbs, prepositional phrases; modals and dependent clauses as well as
inflectional elements specify and modify the meaning of the expression. But one could see
this the other way around: the verb with its arguments constitutes an event which itself
becomes an argument of another predicate, the modifier: thus, in the sentence

I gave Jane the ball in the afternoon

we could analyse "in the afternoon" as the modifier of the verbal expression “I gave Jane the
ball” or we could view “in the afternoon” as predicate designating all events that took place in
the afternoon, where the event “I gave Jane the ball” is its argument. The preposition itself could be viewed as a predicate with two arguments: the DP (in the afternoon) and the event. If all lexical elements have extended projections with analogous structure, we have to expect for PPs a (inner) layer where the predicate argument structure is expressed in a way similar to the structure of a VP shell.

Which part obligatorily belongs to an extended projection? Is every functional projection above the VP part of its extended projections? If we take the strong analysis of Cinque’s hierarchy then every FP of the hierarchy is part of the sentence, whether it is expressed overtly or not. In this case we could take every projection above the VP including the VP, to be the extended projection of V. This gives us (in most theories, which state the VP to be lowest part of the sentence structure) the whole sentence. If we take a weaker interpretation of Cinque’s theory, which takes only the overt parts to be present, we can still have the whole sentence as the extended projection of the verb, but with a different structure. So the first question is, whether extended projections should be allowed to have different structure (even if extending an XP projected by the same lexical element).

The strong interpretation of the Cinque hierarchy encounters an additional difficulty. There is a group of modals that seem to be incompatible with questions and imperatives:

* Did you probably go to school?
* Go allegedly to school!

This could mean that the value of some force operator in the highest part of sentence selects a different group of functional projections. It would seem that a certain part of the split IP is dependent on two sides of the hierarchy: projected by the verb from below and selected (or not) by the force operator from above. A possible explanation could be that the extended projection of the Verb goes only up to a certain point of the functional hierarchy (below the modal section) sitting in the complement of another (functional) element, which has its own extended projection. But this is highly speculative and the question remains: How high does the extended projection go?

Are extended projections connected? In general there is no reason to exclude unconnected extended projections. We might think of Kayne’s latest proposal of (argumental) PPs generated above the VP and attracting their DP from a position imbedded in the VP as an example for this kind of structure:
The two segments in boxes could be viewed as parts of the same extended projection. They are obviously separated by the intervening V-projection. Another interpretation could be to locate the total extended projection of P in the upper box including a structural position for the DP.

Some theories (and I will adopt these) postulate functional heads responsible for assigning/checking thematic suffixes such as applicatives to the verb. There are languages like Chichewa that have thematic suffixes that refer to PPs. So it would be desirable to have the corresponding functional heads in the same extended projection as the prepositions. We could think of a structure like this:

```
      P''
     /
    P''
    /
   P
   /
  K''
  /
 K''
 /
 K    morph'
    /
   morph
    /
  morp
```

or the order between P- and morph-projections reversed. But theoretically they also could be separated by some intervening material (overt or covert):

```
      P''
     /
    P''
    /
   P
   /
  K''
  /
 K''
 /
 K    X''
    /
   X''
    /
   X    morph'
    /
   morph
    /
  morp
```

If the intervening projection cannot be made part of the extended projection, we have the (undesirable) case of disconnected parts that are in some way related. But following the intuition that extended projections are more than just a union of somehow semantically related projections, that they are a structural unit layered between basic projections and trees, and given the fact, we have some freedom of definition, I would regard in this case the two parts
as different extended projections, which are related externally. So I would stipulate extended projections as being connected.

Another question remains regarding the structure. At first sight, as we look upon VPs and DPs, there is no problem. Their extended projections seem to be complete phrases. But if we look at the Split-IP part of the sentence and extend the Cinque hierarchy to prepositional phrases we encounter some difficulties.

If we take Kayne's idea of positioning prepositions directly as heads on the main projection line and take sentences with two prepositional expressions, we would get stacked PPs, one above the other:

I prefer not to include the extended projection of one preposition in the extended preposition of another. In this case it is advisable to take extended prepositions generally as subtrees. With this structure there is no problem to exclude PP\textsubscript{2} from the extended preposition of PP\textsubscript{1}.

These considerations lead me to the following provisory definition:

**DEF:**

An extended projection of category C is a connected subtree that provides the maximal functional structure that is projected by a word of category C.

This is not a very formal definition. How can it be made more concise? Looking at the structural relation between nodes, or now better basic projections, and extended projections, we find the following possibilities:

a) Each basic projection belongs to at least one extended projection

b) There are basic projections that can’t be assigned to an extended projection. We could think of some functional structure, which provides a kind of skeleton to which extended projections are attached (e.g. in specifier positions).

Let’s first look closer at case a), which can be subdivided into the following three sub cases:

a1) Each basic projection belongs to one and only one basic projection.

This would clearly define a subdivision of basic projections into equivalence classes, each defined by the membership to some extended projection. Remember that
relations of equivalence are symmetrical, reflexive and transitive. If extended
projections bear some syntactic reality, the relation “being a member of an extended
projection” should be expressed syntactically. Tree structure as dictated by the LCA is
narrowly restricted and there are not many possibilities to define meaningful relations
of equivalence among basic projections (or nodes).
For instance the relation “being dominated by the same node” only constitutes a trivial
relationship of equivalence. Every node in a tree is dominated by the same node,
namely the highest node, the sentence node.
Since we defined extended projections as being connected, the relation of equivalence
should rely on our basic projections. A minimal non-trivial set of connected basic
projections is either in a Spec or in a Comp relationship. Thus, every relation that
defines extended projections must be based on one of these two or both.
But neither the Spec or the Comp relation alone constitute an equivalence relation,
because they are not even symmetrical: If the basic projection B sits in complement or
specifier position of A then A would not sit in either of these position of B! But we
could extend the Spec relationship to the two relations:
“Sitting on the same straight right branch” and
“Sitting on the same straight left branch”, which are both clearly
1. reflexive: trivially every basic projection sits on the same straight right (left)
branch as itself.
2. symmetric: If A is on the same straight right (left) branch as B so is B on the same
straight right (left) branch as A.
3. transitive: If A is on the same straight right (left) branch as B and B in the same as
C then A and C belong to the same straight right (left) branch.
Generally, it can be shown that every equivalence relation that results in connected
structures and that is purely structural determined, consists of either only specifier
relations (the straight left branch relation), only complements (the straight right branch
relation) or both (the trivial constituent relation, which has only one class, the whole
tree).
The straight left branch solution has one great conceptual problem: It doesn’t permit
cyclic movement: Movement to the right is prohibited by the LCA. Movement to the
left is only permitted to the left most specifier position:

If the moved constituent has on top an unlinked specifier position, this would be
available as landing site for other elements etc. All other positions wouldn’t C-
command their traces! This model seems to be too restricted. More plausible seems to
be the only other equivalence relation, the straight right branch model.
This would mean that the whole sentence would entirely consist of extended
projections, which build right branch skeletons, to which other extended projections
could dock in specifier positions. A possible model could look like this:
This partly resembles Cinque's model. AdvP, with possibly their own projections, sit in specifiers of the main projection line. But the heads of the functional projection don't. They could be viewed as the link between the extended projections of the verb and the adverbs.
Formally we would define:

**DEF:**

An extended projection of a basic projection A is the set of basic projections that sit on the same straight right branch as A.

**a2)** At least some extended projections lie entirely within another one. We could view the whole main projection line as the extended VP which bears as an integral part, certain extended projections of modifiers. This would coincide with Kayne's view of prepositions sitting in heads of the main projection line. We could think of Ps sitting below their argument DPs where they would remain in the case of postpositions but would undergo head movement in the case of real prepositions. Their base position would be the focal point from where to project. Here again arises the question of how high we would like to view the extended projection. One possibility would be to stop the extended projection at the beginning of the next modifier:
Another possibility would be to view higher extended projections as part of lower ones. If we take a modifying PP as a predication over events, we can say that each higher PP modifies this predication. This could give us the very simple definition for extended projections as taking everything above the projecting category. Problematic in this case would be the CP layer. If there is only one topic and one focus position for the whole sentence, this clearly cannot be reanalysed as information structure of a single constituent like a PP.

Formally we could define the extended projection as a partial straight right branch with the lowest element being the basic projection, which projects:

**DEF:**

An extended projection of a basic projection A is the set of basic projections sitting on the same straight right branch as A and dominating it.

Or if we want to close the extended projection at a (yet to be specified) height:

**DEF:**

An extended projection of a basic projection A is the set of basic projections sitting on the same straight right branch as A and dominating it, but not dominating a certain barrier projection.

a3) Some extended projections intersect non vacuously with others. This hypothetical possibility does not resemble any linguistically interesting configuration.

If the intuitive notion of extended projection has some kind of uniform syntactic structure in a restricted antisymmetric framework as proposed here, we do not have many choices. The simplest realisations are the strict right branch equivalence class and the model in which everything above the projection category belongs to its extended projection. But noteworthy also is the model in which several extended categories (e.g. of PPs) can follow each other like pearls in a row. Data about internal structure and theoretical considerations about movement constraints might help to decide between the different models.

If the complete extended projection sits in the specifier of a projection on the main projection line, we would encounter no problems with internal movements. Let's take for example a PP. The lowest projection should determine the whole extended projection. This could be either the preposition itself or an (empty) head of more abstract nature (like PLACE, TIME or INSTRUMENT), but let's assume for the moment it is the P without overt material in the specifier or the complement. Above we could find a projection with the ("complement"-) DP sitting in its specifier (as in early version of Kayne's proposal for PPs):
If we don't have any following movements, the order DP P would correspond to the surface order and we could analyse the P (or more generally the adposition) as a postposition. But the PP could move to a higher specifier above the DP, so that we arrive at the normal word order for prepositions: P DP

\[
\text{YP} \\
\text{PP}_1 \\
\text{P'} \\
\text{P} \\
\text{X'} \\
\text{X} \\
\text{t}_i
\]

(X and Y some cover heads)

If the P would be attached directly to the main projection line, we could not move the PP independently around without the material sitting in the complement position, which means the whole lower tree. The only way out would be to move the overt material of the lower tree to an intermediate position between the DP and the landing position of the P, otherwise we violate the Cyclicity Constraint. But then we would have intervening material between the preposition and its complement DP, which is highly undesirable.

\[
\text{YP} \\
\text{P'} \\
\text{P} \\
\text{X'} \\
\text{X} \\
\text{t}_i
\]

A better solution, if attaching the P directly to the main projection line, would be to abandon the idea of P moving at all. The contrast between prepositions and postpositions has to be accounted for in a different way. A possibility would be to assume that the overt adposition in prepositional languages is base generated above the projection with the DP in its specifier. The head that projects the whole extended projection is below the latter and overt only in the case of postpositions.

\[
\text{YP} \\
\text{P'} \\
\text{P} \\
\text{Z'} \\
\text{Z} \\
\text{X'} \\
\text{X} \\
\text{t}_i
\]
Going back to head movement, where Prep is generated below DP and hops around the DP doesn't seem to be a good solution. A P sitting along the main projection line would block V-movement by means of the HMC. So we would end up in a mixed system with XP-movement for V(P) and head movement for P. On the other hand there is evidence in Dutch and in German for having both heads around the DP. Certain complex prepositions can be expressed before and after their noun complement:

In German:

um den Berg herum
around the mountain "her"around 'around the mountain'

In Dutch:

daar over heen
there across to 'across it'

er achter vandaan
there behind away 'away behind it'

(Hermantel(2002,39))

A more serious problem arises with external movements. If Kayne is right to assume that certain DPs are moved from below (e.g VP shell) into the extended projection of the adposition, we would get a serious violation of the C-command Constraint if the extended project sits in a specifier position and the landing position is not the outermost specifier. And if it were the outermost specifier, there would be no position above available for hosting the preposition (after moving from below or base generated after moving the DP). Another serious problem with extended PPs sitting complete in a specifier concerns preposition stranding. Any separation of preposition and DP would be a violation of the strong Island Constraint. If we want to respect at least the weak Island Constraint, we would have to move the constituent, which we want to extract, first to the outermost specifier.

So far we have discussed the possible configurations of extended projections, if they have a simple syntactic description. But we cannot exclude, that the notion of extended projection has no uniform syntactic counterpart.

2.6 Sequences of Modifiers of the same category
With modifiers I mean all kinds of elements that modify the core sentence. They do not have to be expressed overtly to render a sentence grammatical. We know several types like adverbs, prepositional expressions, modals or even clauses of various types. The general hypothesis for the following is that modifiers of the same category have analogous internal and external structure. That means they can be represented by the same extended projection, which is linked to the next higher node always in the same way, always as complement or specifier.

**Hypothesis of Equivalence:** all modifiers of the same category have the same extended projection and are linked to the rest of the tree in the same way.

If we think of syntactic structure as mirroring (resp. being mirrored by) semantic relationship we could go one step further and postulate that all modifiers in the same relationship to the lower part of the sentence (in modifying the core proposition) are structurally related in an analogous way to the (lower part of the) tree:

**Hypothesis of Linkage:** all modifiers are linked to the rest of the tree in the same way.

Lately there has been great progress in showing that modals, auxiliaries and adverbs can be treated in an analogous way, especially by Cinque's work. In this work, I want to examine whether it is possible to include prepositional expressions.

### 2.7 Derivations

If we take the view that the principal building blocks of syntactic structures are not heads but basic projections, at first sight, we seem to go against our basic intuition of the Merge operation.

The common way of looking at Chomsky’s basic operation of connecting pieces, is to take a head out of the numeration, merge a complement, then merge to this resulting structure a specifier and so on. But this recursive merging process does not prevent the building of structures that don’t obey the restrictions imposed by the LCA. And this is quite reasonable, because Chomsky doesn’t restrict himself to the LCA: Let’s take a closer look at Chomsky’s exact description of the mechanism. He states:

… derivations make a one-time selection of a lexical array LA from Lex, then map LA to expressions, dispensing with further access to Lex.

(Chomsky (1998,100f))

Elements of the lexicon which are considered as assemblies of feature sets, are selected and gathered in the numeration. There follows...

… the operationMerge, which takes two syntactic objects \((\alpha, \beta)\) and forms \(K(\alpha, \beta)\) from them

Syntactic objects are either elements from the numeration or structures already merged from other syntactic objects. They are combined to build up a new syntactic object. If we impose the restrictions of the LCA on this mechanism we could say that UG provides every lexical element (redundantly) with the ability to project at least into a basic projection. In other words, elements in the numeration are words with potential structure, or basic projections dominating lexical words. Let’s look at a very simplified example:
The operation Merge takes two of these elements and combines them, putting one of the structure either in the specifier or in the complement of the other:

Merge can combine elements of the numeration with already merged structures:
Thus the complete sentence structure can be built out of basic projections with the difference with respect to Chomsky's definition, that only structures are generated that obey the LCA. We formally can define the Merge operation:

**DEF:**
Given two connected subtrees \{H, Link\} and \{H', Link'\} with highest nodes A and A' where A' has an unlinked specifier, i.e. there exists no B \in H' with Link'(B) = (A', Spec). Then we define the new subtree M = \{H \cup H', Link''\} with Link''/H = Link , Link''/H' = Link' and Link(A) = (A', Spec) and call it the resultant subtree of the operation of **Spec-merging** \{H, Link\} to \{H’, Link’\}.

Given two connected subtrees \{H, Link\} and \{H’, Link’\} with highest node A \in H and lowest node A’ \in H’ where A’ has an unlinked complement, i.e. there exists no B \in H’ with Link(B) = (A’, Comp). Then we define the new subtree M = \{H \cup H’, Link''\} with Link''/H = Link, Link''/H' = Link' and Link(A) = (A’, Comp) and call it the resultant subtree of the operation of **Comp-merging** \{H, Link\} to \{H’, Link’\}.

### 2.8 Movement

The next elementary operations besides Merge in the minimalist framework are Agree and Move. Quoting again Chomsky (1998,101):

...Agree, which establishes a relation (agreement, Case checking) between an [linguistic item w.s.]LI \(\alpha\) and a feature F in some restricted search space (its domain)...

...A third operation is Move, combining Merge and Agree. The operation Move establishes agreement between \(\alpha\) and F and merges \(P(F)\) to \(\alpha\) where \(P(F)\) is a phrase determined by \(\alpha\) (perhaps, but not necessarily its maximal projection) and \(\alpha P\) is projection headed by \(\alpha\). \(P(F)\) becomes the specifier (Spec) of \(\alpha ([Spec, \Phi])\). Let us refer to Move of P to [Spec, \(\Phi\)] as A-movement, where \(\Phi\) is an agreement feature (\(\Phi\)-feature); other cases of Move are A'-movement.

Move is an operation which attracts a lower phrase to a specifier position in the course of establishing an agreement relation between the head of the attracting projection and a feature somewhere in the attracted phrase. This definition of Move is quite restricted, though fully compatible with the view of building up structure out of basic projections.

First consider the moved element: Chomsky describes it as a phrase, though not necessarily its maximal projection, pied – pied by the feature. The fact that he speaks of phrase together with the only possible landing site as being a specifier suggests that he is not thinking of moving a head. Head movement is commonly thought of as moving from head to head position following the head movement constraint (HMC), which forbids skipping intervening heads. In Chomsky’s following paper "Derivation by Phase", we get another hint that he doesn’t consider head movement as part of syntax. There we find a remark concerning movement of the verb, which normally is the prototype of head movement (Chomsky (1999,30)):

*The account so far leaves open the possibility that V-raising is comparable to TH/EX and DISL: not part of the narrow-syntactic computation but rather an operation of the phonological component.*
In the framework presented here, where the atomic building blocks are basic projections, heads don't exist as independent elements. Of course it would be possible to expand the theory to include subparts of basic projections such as heads as independent atoms, in the same way as going from protons to quarks, but we would arrive at a structurally less restrictive model and lose its simplicity. What would it mean to move a head? If we take the head out of its projection and move to another position (adjunct to another head) we leave behind a structure with a possible specifier and complement without the head that projected them. In a copy theory of movement (which is commonly assumed nowadays) the moved element is a copy of the head. The remaining head will not be pronounced. What does it mean to adjoin the copy to another head? In the new position it cannot project its syntactic properties any more. A possible solution would be to view head movement as a movement of only phonetic features to the next head, leaving its syntactic features behind (which would also mean having Agree in situ). But this would be very different to certain kinds of XP-movement such as focus-movement or Wh-movement, where the moved element takes its wh-feature along to a position where it can be checked and interpreted. In Chomsky (2000,5) we find:

\[
\text{Let us assume so, understanding this to mean that there is no feature movement and hence no "modified lexical items"(MLIs) with features attached to them. That improvement is of some importance: feature movement is a complex operation, requiring some notion of "feature occurrence" that is not very clear; MLIs also introduce many complications, best avoided if possible.}
\]

Another asymmetry between head adjunctions and XP adjunctions (or specifiers) concerns the origin of the adjoined element. In the case of XP, the "Merge" of the adjoined element (or the element in the specifier) can be either external (pure Merge) or internal (Move). I know of no theory which permits external Merge of a head to adjoin another head. The adjoined head must move to its position from inside the structure and not from the numeration. Besides structural arguments, movement of non-phrasal subtrees would betray everything phrases were invented for. They were originally defined as the parts that could not be split via movement. This is good reason to restrict ourselves to XP movements. Phrase movement is very easily obtained. One copies the phrase and links the copy to a loose end in the higher structure. The lower copy would either be replaced by a trace with the same linking properties or it remains and loses its property of being pronounced overtly. We achieve this by adding a copy of the phrase to the tree (all the heads are doubled together with their internal links) and also a new relation between the new phrase and the old tree (that means we link the whole copy to some empty specifier or complement position).

**DEF:**

Given a tree \( \{H, \text{Link}\} \) with heads \( A, B \in H, \) a Relation \( \text{Rel}_1 \in \{\text{Spec, Comp}\} \) and \( \text{Link}(A) = (B, \text{Rel}_1) \) and another head \( C \) and a \( \text{Rel}_2 \in \{\text{Spec, Comp}\} \) with \( (C, \text{Rel}_2) \) not in the image of \( \text{Link} \) (either Spec or Comp is unlinked) then we define the tree \( \{H', \text{Link}'\} \) with \( H' = H \cup t_i \) and Link' = Link except for \( \text{Link}(A) = (C, \text{Rel}_2) \) and \( \text{Link}(t_i) = (B, \text{Rel}_1) \). We call this the tree deduced from \( H \) by **Move** of the phrase XP with maximal head \( A \) from \( B \) to \( C \).

This defines Move as building a copy of any element and connecting it to any free link in the tree. This definition alone is quite unrestricted and would generate more sentences than wanted. Remember that a good syntactic theory should not only be able to generate all
grammatical sentences but also exclude all ungrammatical ones. What we need, after having constrained X-Bar structure, are well-motivated restrictions on movement.

**What are the elements that can be moved?**
According to their categorical status, we have shown that the only elements that can be moved are maximal projections or phrases. This means only XP-movement, no head-movement and no movement of intermediate projections.

**What are the possible starting positions?**
There are two possibilities: phrases in complement position and phrases in specifier position. Syntactic theory so far has neither excluded one or the other. In GB times and in most minimalist approaches, analyses concentrated mostly on movement from specifier position. But movement of the object, which sits in a Comp position, had always been discussed. Movement out of a complement played lately a greater role especially in antisymmetric analyses especially with the notion of remnant movement. From a greater constituent sitting in a complement position nearly all overt material is moved away. Afterwards, the remaining constituent, the remnant, is moved out of its Comp position. Usually this remnant is the VP (shell) from which all arguments have been stripped away. There is no exclusion of one or the other type of movement. For the moment I simply want to present the possibility of restricting movement either to specifier movement or to complement movement.

**What are the possible landing positions?**
Up to now, we have not defined which are the possible landing position of movement. Either a complement or a specifier can be moved to complement and specifier position. This is different from Chomsky’s proposal.
Free complement positions could be found in a projection sitting in the specifier of another projection. But I am not aware of any analysis that has movement to a complement position. Though not excluded by the structure, it does not seem plausible. The X-bar structure is not symmetrical in this respect. Complements are sister of the head, specifiers sitting under one segment of the maximal projection.
Things look a bit clearer if we add the ECP, which states that empty categories should be properly governed and especially that traces are C-commanded by their antecedents. A free complement position to the left of the moved category would never C-command it, because complement nodes can only C-command the selecting head. Moreover, every node under the complement node cannot C-command anything outside the complement node and the possible candidate of movement is clearly outside. Here is a closer look at this condition:
With the definitions of straight left and straight right branches from above we can say that the only available position for a landing site for movement is an unlinked specifier position on the straight left branch of a maximal projection which heads a straight right branch, that includes the starting position of the movement. (The LCA in Kayne’s formulation allows asymmetric C-command from specifier of a specifier position, but a complement position can never C-command out of their maximal projection):
A landing site in the specifier of A in the above diagram is impossible, because it doesn’t C-command the trace.

I want to mention a problem this constraint raises in connection with remnant movement. Most theories of remnant movement give examples where the remnant raises higher in the tree than the first moved element. This ends up in a configuration where the first moved element doesn’t C-command any longer its trace (because the latter has moved together with the remnant). But it could be argued that in copy theory of movement, there is still a trace of the first element in its basic position that is C-commanded. To cover these case (that play a great role if we assume cyclic movement) I will distinguish two constraints:

**C-command constraint on movement** (strong version): the moved element must C-command its trace at all steps of the derivation (given that traces can be removed by subsequent movements and not copied)

**C-command constraint on movement** (weak version): the moved element must C-command its trace (only) directly after the movement.

A further constraint comes into play in pure minimalist models. In Chomsky’s model, structure is built from bottom to top. Each step of the derivation is either Merge or Move to the highest position of the actual derivation. Once a level above a certain projection XP is constructed no movement is possible to (the specifier position of) XP anymore.

**Cyclicity constraint on movement**: constituents can not move to a position below the landing position of an already moved element.

This has consequences for remnant movement. The remnant must always be moved higher than the elements that have been moved out of it before. This stand is in contradiction with the strong C-command constraint. If we maintain both constraints, remnant movement is forbidden!

Another constraint should be mentioned which is often used:

**Island constraint on movement** (strong version): No phrase can be extracted out of a specifier via movement.

This constraint has strong validation from existing data. In many cases, where movement has clearly taken place, the moved elements cannot be separated any more. Haider(2002 a) takes this to be a strict constraint:

*If grammar theory has produced insights into cross-linguistically valid invariants at all in the last decades, the prime candidate is the opacity effect for constituents in spec positions. Extraction of subconstituents of phrases in spec positions produces robust unacceptability effects.*
But this position is not undisputed. If we analyse PPs as components sitting together in a specifier position it would be impossible to explain preposition stranding, as in sentences such as:

Where, do you come from?

Another problem is the case of quantifier floating. Several theories take quantifiers as base generated in the (subject or object) DP, which can be left behind in all intermediate positions that the DP passes on its way up to its superficial position.

All die Jungs haben am Dienstag im Park gesungen.
All the boys have on Tuesday in the park sung
'All the boys sang in the park on Tuesday'

Die Jungs haben alle am Dienstag im Park gesungen.
Die Jungs haben am Dienstag alle im Park gesungen.
Die Jungs haben am Dienstag im Park alle gesungen.

In order not to abandon totally the Island constraint, another version was formulated:

**Island constraint on movement** (weak version): No phrase can be extracted, via movement, out of a specifier, besides its outermost specifier.

This gives us an escape hatch: Every constituent that can be stranded, first has to move to the highest specifier. Then it can move out.

**Locality constraints, how far can a constituent be moved?**
In early works certain barriers prevented constituents from crossing over. In his most recent publications, Chomsky defined phases, which serve a similar purpose: to constrain movement. CP and vP are considered strong phases. Movement inside is unconstrained, but if anything wants to move out, it has to pass the escape hatch of the "edge" of the phase, which is the highest head (in case of head movement) or the highest specifier. This constraint could be viewed as a generalisation of our Island constraint in its weak version.

**Relativized Minimality**
L. Rizzi proposed a special type of locality constraint, the Relativized Minimality, which is now generally accepted. It states that a relation between two syntactic nodes can only hold if there is no intervening node that could participate in the same relation. For movements, this means a higher element attracts the closest possible constituent which bears the required features. In Rizzi (2002) we find the following example for wh-movement:

How, did you solve the problem?
I wonder who could solve the problem in this way.
* How, do you wonder who could solve this problem?

In the second (ungrammatical) question, a covert wh-operator attracts a wh-word. But between the lower "how" is another intervening wh-word, "who", which is closer. The
attraction of "how" is therefore excluded. In order to specify what counts exactly as potential intervener, Rizzi defines the following feature classes:

- Argumental: person, number, gender, case
- Quantificational: WH, Neg, measure, focus, ...
- Modifier: evaluative, epistemic, Neg, frequentative, celerative, measure, manner, ...

(Rizzi (2002,19))

Thus a quantificational element like a wh-word counts as a potential intervener for a quantificational relation, but not a modifier.

A last question concerns the motivation

**Why do constituents move?**

To this question, there exists no complete list of possible answers as in the case of "Which category can be moved?". There have been a lot of speculations and I give a short overview of the more important answers without claiming to be exhaustive.

In the eighties movement was considered unmotivated. The operation "move α" could take place whenever possible if not restricted by other principles. This situation changed with the presentation of Chomsky's minimalist program. Movement is now constrained to the task of feature checking. The derivation starts with a set of linguistic items taken from the lexicon, which are bundles of features. Among the features we find semantic features that are interpretable at the conceptual-intentional interface and phonetic features that are interpretable at the sensomotoric interface. But we also find purely syntactic features like case and agreement, which are not interpretable at any of these two interfaces. According to the principle of full interpretation, they have to be cancelled during the derivation. The proper way to do this according to Chomsky is the movement of a (lexical) element with equivalent features into the local neighbourhood of the element with the uninterpretable syntactic features. Here they can be compared, checked, and, if the features are equal, cancelled. Another motivation often found in the literature is licensing. Syntactic elements with certain features have to be licensed in a certain position. Nominative case could be viewed as this kind of feature. The subject is base generated in the VP shell as argument of the verb, but its nominative case cannot be licensed there. It must move up to spec IP, which is the usual licensing position for nominative case. Wh-movement is another example. In the sentence:

```
Which book do you read today?
```

the object is base generated in the VP shell and bears an wh-feature, which can only be licensed in spec CP. Therefore it must move up. As we find in (Koopman (2000,3)):

```
The specifier-head configuration emerged as "the" syntactic licensing configuration: particular constituents (DPs, wh-phrases, etc.) must appear in a specifier-head relation with a designated head, and they get into this configuration by movement, either overt or covert.
```

Kayne proposes in Kayne (2000) a new analysis of the scope relation. In the past, it was commonly assumed that the constituents that are interpreted as being under the scope of a certain operator, have to appear to its right at the interface level of LF, which very often involves movement (overt or covert) of the operator to their left. For certain operators like negation, focus and "only", Kayne shows that their behaviour can be better explained by
moving the constituent under consideration to the specifier of the scope-taking operator. One condition seems to be that this movement is overt, another that it is accompanied by verb movement. I will return to the exact kind of derivation later. Here it shall suffice, that a motivation for movement can be the need to get into the scope of a certain operator.

In the previous Chapter, I outlined the idea of Barbiers (1995), who proposed a correlation between X-Bar structure and semantic interpretation. A semantic relation between two nodes is always mediated by an intervening node (a head could establish a relation between his specifier and his complement). A special relation called qualification is defined between a node and its moved copy. I repeat here for convenience the relevant definitions:

**Principle of Semantic Interpretation (PSI)**

I. A node $Z$ establishes a S(emantic)-Relation between a node $X$ and a node $Y$ iff $X$ immediately C-commands $Z$ and $Z$ immediately C-commands $Y$.

II. A node $Z$ is a Qualifier of a node $X$ iff $Z$ establishes a S(emantic)-Relation between $X$ and $Y$, and $X$ and $Y$ are coindexed.

(Barbiers (1995,7))

The moved element moves in a position from where to C-command the qualifier in order to establish a qualification. For Barbiers, this is the only valid motivation for movement:

**The interpretative nature of movement**

All movement is triggered by the need to establish a qualification configuration. If a movement operation does not yield a qualification configuration it does not take place.

(Barbiers (1995,34))

**No look ahead**

Early versions of the minimalist program viewed grammatical sentences as the result of a competition between possible derivations starting from the same numeration. Each of the derivations has to pass over a string to LF with features that are all interpretable by the cognitive-interpretative system and another string to PF with features that are all interpretable by the sensomotoric module. If both strings are fully interpretable, the derivation is assumed to converge and survive. Otherwise it crashes.

This idea permits local movements (or their omission) whose motivation is not clear by itself, but is justified only at the end of the derivation. A common view on verb movement in German is to assume that (as usual) verbs are base generated low. The C head needs to filled overtly either by an overt complementizer or by the verb. In case of dependent clauses with an over complementizer the verb does not move at all and we get verb final structure. In main clauses the verb rises to the C position and topicalised material goes in front so that we get verb second structure. If we consider head movement, the verb has to pass several heads before arriving at the C position. The question arises, as to how the verb knows whether in a later step of the derivation there will be inserted an overt C or not. Since it needs to move cyclically it cannot wait until the Merge of the C-position and then move from the bottom to the top. It has to move to the next available intervening head position as soon as this head is merged. This means it has to "look-ahead" in order to know the future of the derivation.

This is a view that has changed radically in recent minimalist analysis. Chomsky writes:

... much recent work, which has sought to eliminate comparison of derivations, backtracking and look-ahead, and "non-local" operations generally.
Today it is generally assumed that constituents do not "look ahead" to fulfill the needs of a future step. Movement is motivated locally at the step of the movement itself.

2.9 The Parameters

One of the most intriguing questions of modern linguistics concerns the parametric variation among languages. In earlier versions of Generative Grammar, especially in theories of Government and Binding of the eighties, we find a vast number of very different kinds of parameters among which the head parameter is salient.

A common analysis in this time was to assume that languages differ from each other as to whether their heads are found to the left or the right of the complements. The former property was attributed to VO languages, the latter to OV languages. But mixed cases were also debated, German, for example, which was assumed to have the V and I head to the right, but the C to the left. In an antisymmetric framework this parameter is no longer available.

Chomsky's minimalist program (in the early versions) reduced the variational system to only one type of parameter, the weak versus strong feature, which states that every uninterpretable feature of a functional head searches for a counterpart to be checked and cancelled. In order to do this, the element bearing the partner feature has to be inserted or moved up into the specifier of the functional head. Each feature has a meta property. If the property is weak, a movement can be delayed until after Spell Out. Principles of economy will assure that in this case the movement will be delayed indeed. Strong features necessarily need the cancelling feature in the specifier before the deviation to PF.

Later versions of the minimalist program restate this condition in terms of the EPP parameter: A "probe" can search for an equivalent feature among the elements that are C-commanded by it. Once found it establishes an Agree relation with this goal. Independent of this Agree relation, the EPP feature determines whether the probe needs overt material in their specifier. This can either force the goal to move into this position or a kind of expletive to be base inserted there.

The distinction between overt and covert movement can be reviewed in terms of pronunciation of elements in a chain. The minimalist approach can be restated without taking recourse to delayed movement. We can assume that in every language every element moves overtly, but the difference is the place where the moved element is spelt out. Covert movement would thus be equivalent to spelling out the trace and not the moved copy; overt movement would correspond to spelling out the moved copy.

The important new idea here is assumption that derivational processes themselves don't differ among languages. Parameters are reduced to differences in properties of functional elements. Since functional elements are words, sitting in the lexicon, we arrive at a very uniform picture of UG: The general way how a numeration is processed is universal, languages differ from each other only in their lexicon.

R. Kayne shares this view in general. We find in Kayne(2003,1f):

Now a widespread idea about syntactic parameters is that they are limited to being features/properties of functional elements, as opposed to ever being features of lexical elements. ... Limiting syntactic parameters to features of functional heads is also intended to exclude the possibility that there could be a syntactic parameter that is a feature of no element of the lexicon at all, e.g. there could presumably not be a parameter of the sort 'language L has or does not have bottom-to-top derivations'.
This constraint reduces dramatically the number of possible parameters. We cannot assume e.g. that one language obeys the C-command Constraint of movement while another does not. Another commonly assumed parameter, the pied-piping parameter, becomes problematic as well.

It is well known that certain constituents, that are attracted to a higher position take with them a bigger chunk, they pied pipe the bigger constituent. Wh-raising is an important example.

Whose car did you see today?
* Whose did you see your car?

"Whose" is the questioned constituent, but it is unable to move up to sentence initial position without pied piping the whole constituent "whose car". Sometimes it is assumed that the ability of pied piping is a general property of a language and constitutes a parameter. This would be a contradiction to the idea of restricting parameters to features/properties of functional elements.

If in a certain language only certain constituents permit pied piping, others not, we have the possibility to reduce this parameter to a meta property of a functional head. Let's take the case of a VP that's sits in the specifier of a functional head. The VP is supposed to move up via specifier movement in all languages. But languages differ as to whether the VP pied pipes material that is below this functional head. In this case, we can attribute this language variation to a property of the functional head. A parameter like language A permits pied piping and language B not at all however could never be reduced to a difference in this kind of property.

Kayne (in Kayne(2003)) discusses pronunciation versus non pronunciation of grammatical elements as a possible parameter. He claims, that e.g. French has no overt counterpart of the English (grammatical) word "little". What at first sight seems to be the proper translation, "un peu", has, in fact, nominal character and is more equivalent to the English "a bit". This explains the difference between

peu *(de) sucre
little *(of) sugar

He takes "little" as the overt realisation in English of an abstract universal functional element LITTLE, that is in French only covertly realised.

Koopman and Szabolcsi (2000) discuss another type of parameter concerning the "heaviness" of constituents in certain specifier position. Some projections do not tolerate constituents with a certain complexity at least at the end of the derivation.

In this chapter I introduced a tree definition based on basic projections, which I hope will give new insights into the relationship between syntax and the lexicon. Apart of the restriction that it does not permit head movement, it is entirely compatible with traditional antisymmetric views of tree structure. Therefore, I will not make extensive use of these notions in the following chapters. But I will try to evaluate the different derivational models that I present against the possible constraints and restrictions that are presented in this chapter. I will hold onto the hypothesis that a correct grammar, apart from being descriptive and explanatory adequate, should be simple, restrictive and plausible.
3 Affixes in Syntax

3.1 Introduction

Most linguistic theories propose that the verb is generated in a low position, if not in the very lowest projection. During the derivation it moves up, either overtly (before Spell Out) or covertly (after Spell Out). During this rising, it either checks morphological features in associated functional projections or gets attached to its affixes. Problems with head movement led to the idea of attributing verb movement entirely to PF (Chomsky (1999,30)) as presented in the first chapter. If verb movement is accepted, it is usually supposed to be realised via head movement.

In addition to the conceptional arguments presented in Chapter 2, here I would like to present more data in favour of verb raising via XP movement. In order to get an explanation for certain typological correlations between affixation and syntactic properties, I propose a model where the VP moves into certain specifier positions where it gets attached syntactically to its affixes.

The morphemes I am concerned with here are pure modifiers such as mood, tense and aspect markers. I want to exclude agreement affixes and negation elements as well as valency-changing morphemes such as applicatives and causatives.

Agreement markers seem to be of a different kind as noted earlier by Kayne (1994) and Chomsky. In Cinque (1999, chapter 5.1) we find:

As Chomsky (1995, chapter 4) notes, if all there is to agreement is a morphological relation (with no LF relevance) between a DP in specifier position and the corresponding head, little justification remains for positing the existence of an independent (AgrP) projection (also see Mitchell 1993).

Consequently, we do not find any position for agreement in his hierarchy of functional heads. Speas (1991) agrees with this, giving an example in Hindi in which the semantic verb and several auxiliaries show all morphemes that express agreement with the subject, something we do not find with other types of morphemes:

Raam             roTi  khaataa             rahtaa               thaa.
Raam(Masc)  bread  eat(IMF:Masc)  PROG (IMP:Masc)  be(PAST:Masc)
"Raam used to keep on eating bread"

(Speas (1991,412))

Regarding negation, Cinque gives in Cinque (1999) some arguments which show that negation can appear in several distinct positions. For more details I refer the interested reader to chapter 5.5 of this book.

Valency changing morphemes are morphemes which change the argumental structure of the verb. Applicatives render an oblique modifier into a direct object. Causatives add an agentive subject. Reciprocals identify the object with the subject; the resulting verb has one argument less. In this respect passive can also be considered a valency changing element, since it reduces the number of arguments.

It is this close relation to arguments that renders the valency-changing morphemes special. Whether or not they can be considered modifiers like tense, aspect and mood, thus having a place in the hierarchy of functional projections is a question beyond the scope of this paper. For recent discussion see Damonte (2004). However, I would like to mention that in most
cases where we find superficially non-rigid ordering of morphemes, at least one of these special morphemes is involved. Baker gives several examples from which I present one here. It is from Bemba, a Bantu language:

Naa-mon-an-ya Mwape na Mutumba.
1sS-past-see-recip-caus Mwape and Mutumba
'I made Mwape and Mutumba see each other.'

Mwape na Chilufya baa-mon-eshy-ana Mutumba.
Mwape and Chilufya 3pS-see-caus-recip Mutumba
'Mwape and Chilufya 3pS-see-caus-recip Mutumba.'

Quechua is a agglutinating language which allows only suffixing. A huge number of morphemes can combined in one word. This makes Quechua an interesting source of ordering relations among morphemes. Baker gives the example:

Maqa-ku-ya-chi-n.
beat-refl-dur-caus-3S
'He is causing him, to beat himself,'

Maqa-chi-ku-n.
beat-caus-refl-3S
'He, lets someone, beat him.'

The observed patterns could indicate that these morphemes have a greater degree of freedom to move than other morphemes. An alternative would be to stipulate several distinct positions for each of them, correlated with a slightly different meaning. Either way, both explanations require more research and therefore I want to exclude them here.

3.2 Prefixes and Suffixes

We have seen in the first chapter that there is a correlation between the order of verbal morphemes and the order of certain adverb types. If we attribute morpheme ordering entirely to an independent morphological module, there is no easy way to explain this correlation. Another surprising pattern is Greenberg's observation that there is a relation between morphology and syntax. His Universal 27 correlates the order noun adposition to the place of affixation:

(27a) If a language is exclusively suffixing, it is postpositional
(27b) If it is exclusively prefixing, it is prepositional.

(quoted by Hawkins (1983,21f)

If we look at Greenberg's 30 language sample, we find 12 languages that are purely suffixing. They are all postpositional. We find 17 languages that have prefixes as well as suffixes. 15 of them are prepositional, 2 postpositional. Only one of the observed languages is exclusively prefixing and this is prepositional. (Greenberg (1973, 92)).Based on this corpus, the generalization (27a) seems to be well founded. The universal (27b) however, is based only on a single language and a generalisation is difficult to derive. Following this, J. A. Hawkins later published, with G.Gilligan, the results of research of different groups with special interest in the relation between syntactic (VO versus OV and
postpositional versus prepositional) and morphologic (prefixing versus suffixing) properties (Hawkins and Gilligan (1988)). Altogether they considered about 200 languages and one of the statistical results was the predominance of suffixing over prefixing. Furthermore the authors made a distinction between different types of affixes. Here I give only the results for verbal affixes:

(11) If a language has NP + Po, MOOD affixes on V (if any) are suffixed...
(12) If a language has SOV, MOOD affixes on V (if any) are suffixed with greater than chance frequency...
(13) If a language has NP + Po, TENSE affixes on V (if any) are suffixed with overwhelming greater than chance frequency...
(14) If a language has SOV, TENSE affixes on V (if any) are suffixed with greater than chance frequency...
(15) If a language has NP + Po, ASPECT affixes on V (if any) are suffixed with greater than chance frequency...
(16) If a language has VALENCE affixes on V (i.e. INTRANSITIVE / TRANSITIVE / DITRANSITIVE affixes), they are suffixed with more than chance frequency...
(17) If a language has SOV, CAUSATIVE affixes on V (if any) are suffixed with more than chance frequency...

(Hawkins and Gilligan (1988))

Important here is the correlation between the order of the adposition and the MOOD, TENSE and ASPECT affixes, which are pure modifiers according to our definition. For CAUSATIVES we have a correlation between principal word order (SOV) and affixation, and VALENCE affixes are unconditioned suffixed. The latter two are elements that change the argument structure and the data presented here does not indicate clearly whether we could include them in the set of modifiers.

But agreement affixes are clearly excluded by Hawkins and Gillian from this behaviour:

For the following five affix categories, all four logically possible affix order co-occurrences with word order appear to be possible (i.e. anything goes): POSSESSIVE affixes on N; PERSON-MARKING (SUBJECT) affixes on V; PERSON-MARKING (OBJECT) affixes on V; NEGATION affixes on V; and VOICE affixes on V.

(Hawkins and Gilligan)

Negation and Agreement have been considered by Cinque to not behave like the other modifiers. Since Voice is an argument changing category (passive reduces one argument) it is a candidate for a valency changing element.

Researchers have found that (nearly) all languages that have only postposition do not have prefixes. If this proves to be a true universal, it would mean that there must be some syntactic explanation for the nature of affixation. If we take both, lexical roots and morphemes, to be seated in heads (and for the moment I don't see any reason why to abandon this assumption) then a pure head movement analysis would have difficulties in deriving suffixing in a way different from prefixing.

Since we know that it is the morpheme that determines the category of the construction root-morpheme and not the root the only possible structure in an antisymmetric head adjunction analysis is:
The root climbs up thereby following the head movement constraint and adjuncts to the left (s. Kayne). This gives only suffixing with no room for a syntactic prefixing. Note that because of the head movement constraint (HMC) the verb cannot skip the prefix and climb to a higher position, so that the prefix could rise later to the same position to adjoin to the verb. Even if this were possible, it would result in a structure like:

```
  morph
   \   
  root - -morph
```

where the head of the construction is not the morpheme, but the root. But if we take XP movement of a (remnant) VP that has no overt material besides the verb and if we assume that the local relation for establishing affixation is the spec head relation, we have two possibilities:

a) the (remnant) VP moves directly into the spec of the SuffP which gives rise to the structure:

```
  SuffP
   \   
  VP - Suff'
   \  
 VP' - Suff
    \  - suff
     \  
  V - V'
```

b) the VP moves above the PrefP, but inside its extended projection (let's say to spec, PREFP) and subsequently the pref- moves to the spec, VP:

```
  PREFP
   \   
  VP - PREF'
   \  
 VP' - PREF
    \  
  V - Pref'
   \  
 Pref - pref-
```
The VP, not being restricted by the HMC, can skip the intervening spec, PrefP and the category of the whole construction is determined by the highest head along the main projection line, the PREF-head.

While the second condition seems quite plausible, there are some problems with skipping. It would mean that we would lose all the explanatory force the HMC was constructed for. It seems we cannot get rid of it without substituting it with another constraint.

Rizzi (2002) has shown that the HMC can be viewed as a special concretisation of a more general constraint, Relativized Minimality. He identifies different kinds of categories that inhibit blocking effects for movement of elements of the same kind. These categories are heads, argumental XPs, quantificational non-argumental XPs and non-quantificational non-argumental XPs and modificational XPs. If we abandon head movement, we have to replace the notion of heads with another category. I would suggest the notion of predicate phrase, which would be responsible for (remnant) movement of lexical XPs like VPs, APs or NPs. Movement of these Elements should be blocked by certain interveners. Let's define these possible interveners as elements, which have the same categorical feature as the predicate phrase. For VPs these are the features \([-N, +V]\), which are shared by auxiliaries and via percolation also by their projections.

With these instruments we can provide derivations for the patterns of affixation that we find in the languages of the world. Cinque (1999) demonstrated that the order of the affixes are, in the case of suffixes, always in the reverse orders of their functional projections, whereas in the case of prefixes we find either the original order or the reverse order.

### 3.3 Derivation of the inverted order of suffixes.

Let us start with a basic structure with VP at the bottom and one suffix projection above. For the moment we abstract away from arguments in the VP shell. It is either possible that they have been removed from the VP earlier or that they sit in their own projections above the VP:
Movement of the VP into the spec of Suff₃P, thus forming a complex word form

Merge of the next higher suffix portion of the sentence:

Move of Suff₃P into the spec of the next higher Suff₂P
The next affixal projection Suff₁P is merged above:

and finally the Move of the Suff₂P into the spec of the Suff₁P
which ends with the correct order $V$-suff$_3$–suff$_2$–suff$_1$.

### 3.4 Derivation of the direct order of prefixes:

Basic structure of remnant VP and one prefixal projection complex:

![Diagram](image)

Movement of the VP into the spec of $\text{PREF}_3^P$:

![Diagram](image)

Movement of the $\text{Pref}_3^P$ into the spec,VP, being the outermost specifier of the actual highest projection, $\text{PREF}_3^P$, thus C-commanding (according to Kayne's definition) its trace:

![Diagram](image)
Now the complex built up by the verb and the innermost prefix is moved into the spec position of the PREF₂P. This could either be the PREF₃P or the VP. I show here the option of moving just the VP. At the end of the derivation I will present the final structure obtained by moving the PREF₃P.
As next step we have to move the Pref₂P into the spec of the Pref₃P:

Next Merge:
Movement of VP into spec, PREF₁P:

Finally the Pref₁P is moved into the specifier of Pref₂P:
which gives us the right direct order pref₁ − pref₂ − pref₃ − V..

If we move the entire PREFₖ P instead of the VP out of the spec position we get the following derivation:

Movement of Pref₂ P into spec, Pref₃ P
and finally movement of the Pref₁P into the spec of Pref₂P:

From a technical point of view this derivation has two major advantages compared to the one where the VP hops from specifier position to specifier position:
1. The derivation is made up entirely of merge and complement movement. No specifier movement is involved. In this respect it is a step toward a more restrictive theory. In chapter 5 I show that we can derive the various word orders of prepositional phrases with the same kind of movement.
2. We have a uniform attraction of constituents by their counterparts of the next cycle. PrefₙP is attracted to the specifier of Prefₙ₋₁P and PREPₙ₋₁P to the specifier of PREPₙ₋₁P. This also is a step to a more uniform and restricted theory of movement.

The derivation for suffixes and the one for prefixes share some interesting properties. In both the verb rises up as part of a maximal projection into a specifier position. In the case of
suffixes it ends up in the specifier of a projection with an overt morpheme. Together they build some kind of complex. The whole constituent sitting in the specifier of the SuffP together with its head is interpreted as a word.

In the case of prefixes the head of the target is empty but an XP with the overt prefix moves into the specifier of the VP. Here also the word is comprised of a head (the root) and its specifier (the prefix). This could indicate that the structure between specifier and head does not constitute a word boundary.

The first chapter presented the modified LCA presented by Koopman, which states that no overt material can be found in the specifier and the head of the same projection. Like Sportiche she assumes this to be a generalisation of the Doubly Filled Comp Filter. While I rejected the implications concerning the LCA, I still think that the data presented in Koopman(2000) and Sportiche(1993) is convincing. But maybe the constraint is too restrictive and should be replaced by the following constraint:

**Axiom of word boundary:**

There can be no overt independent words in the specifier and the head of the same projection.

To clarify, there can be overt material in both, but then the material in the specifier and in the head build parts of the same word. A proposal like this of course implies a greater structure than usually assumed, however a lot of data points in exactly this direction. I again refer the interested reader to Koopman(2000) and Sportiche(1993).

So far we have only stated that there is no word boundary between the specifier and its head. There is no constraint on the inner structure of the constituent sitting in the specifier. This definition gives us the possibility to include phrasal clitics like English genitive "s" into morphological descriptions.

A phrase like "the mayor of London's key" could be analysed as the complex DP "the mayor of London" sitting in the specifier of a projection with the overt head "s".

If we look for a more uniform treatment of prefixes and suffixes we have two possibilities:

1. Suffixes and prefixes are seated always in the same projection AffP and both have an additional projection AFFP above. In the case of prefixes, AFFP attracts the VP and the AffP moves into the specifier of the latter. In case of suffixes, the VP moves directly to the AffP and the AFFP is just an empty projection above.
2. The VP is always attracted by the same projection, the AFFP which is the projection where we find suffixes. The AffP below host prefixes. This generalisation has two advantages over the first: Conceptually, it is preferred to always have the same projection that attracts the VP. Empirically, we have an account for circumfixes which seem to sit in the same extended projection. In section 3.5 is as an example the derivation of past participles in German.

In the following I will assume a SuffP on top of a PrefP.

The general idea is for each affix to have an extended projection consisting (at least) of a lower PrefP and a higher SuffP. Both heads can either be empty or filled with overt morphological material. If only the lower head has overt material, it is a prefix. If only the higher head is filled overtly we have suffixing. If both heads are overt, they form a circumfix. Movement is attraction of equivalent projections. A SuffP attracts the SuffP of the lower extended affix projection and PrefP attracts the lower PrefP. Somehow the VP seems to have the same properties as a SuffP for movement properties and thus is attracted to the lowest SuffP.

The suffix derivation and the second prefix derivation share another surprising property: there is no specifier movement involved. The only kind of movement is one which starts from a complement position. If this could be generalized to all kind of movements we would not only
arrive at a more restrictive theory as mentioned above, we would also have an explanation for
the axiom of word boundary. If movement of a specifier is prohibited, then a head can never
be seperated from its specifier. A word can be constructed of several words during a syntactic
derivation, but the derivation cannot tear the consituents apart. This has consequences for the
analysis of separable verb prefixes in German.

3.5 Separable Prefixes

Words like "aufessen" (to eat up), "umfahren" (to run over), "anziehen" (to dress) are usually
considered single lexical entries. Their meaning is idiosyncratic and not compositional,
though they internally are made up of a root and a prefix that shares the phonological form
with a preposition. In dependent clauses the prefixes stay attached to the verb in sentence final
positions:

Die Mutter will, dass Peter seine Suppe aufisst.
The mother wants that Peter his soup up+eats
'The mother wants that Peter eats up his soup.'

Ich habe gesehen, dass Peter den Mann umfuhr.
I have seen that Peter the man around+drove
'I saw that Peter hit the man'

Ich möchte, dass du eine Krawatte anziehst.
I want that you a tie on+pull
'I want you to put on a tie.'

In main clauses however, the verb climbs up into second position leaving the prefix behind:

Peter isst seine Suppe auf.
* Peter aufisst seine Suppe.

Peter fuhr den Mann um.
* Peter umfuhr den Mann
(only possible with the meaning "Peter drove around the man")

Ich ziehe eine Krawatte an.
* Ich anziehe eine Krawatte.

These verbs are not to be confused with another group of verbs with prefixes that are not
separable like "umfahren" (to surround by car) und "verkaufen" (to sell). Superficially they
are very similar to the first group, consisting also of a root and a prefix which sometimes
resembles a preposition. In the second group, however, the prefixes are carried along by the
verb during the movement:

Peter umfuhr den Brunnen.
Peter around+drove the fountain.
'Peter drove around the fountain.'
* Peter fuhrr2 den Brunnen um.

Hans verkaufte seinen Wagen.
Hans VER+buy his car
'Hans sold his car.'
* Hans kaufte seinen Wagen ver.

The difference between the two groups becomes clearer if we look at the formation of the participle. The formation of the past participle for ordinary words is a circumfix consisting of the prefix "ge-" and one of the two suffixes "-t" or "-en". But in the case of non-separable prefixes, the "ge-" prefix cannot be attached:

Ich bin gefahren.
I am GE+drive
'I drove.'

Ich habe Wasser geholt.
I have water GE+fetch
'I fetched water.'

Peter hat seine Suppe aufgegessen.
* Peter hat seine Suppe geaufessen.
* Peter hat seine Suppe aufessen.

Peter hat den Mann umgefahren.  
* Peter hat den Mann geumfahren.  
* Peter hat den Mann umfahren1.

Ich habe eine Krawatte angezogen.  
* Ich habe eine Krawatte geanzogen.  
* Ich habe eine Krawatte anzogen.

Peter hat den Brunnen umfahren.  
* Peter hat den Brunnen geumfahren.  
* Peter hat den Brunnen umfahren2.

Hans hat seinen Wagen verkauft.  
* Hans hat seinen Wagen geverkauft.  
* Hans hat seinen Wagen vergekauft.

The prefix "ge"- is blocked in the case of non-separable prefixes. However we do find it in the case of separable prefixes. The interesting point is that here it is not in front of the prefix but directly in front of the verb root. The data suggests that separable prefixes are not prefixes at all. In German there seems to exist a rule that excludes more than one prefix. However, as Cecilia Poletto pointed out to me, there are some verbs with two prefixes in German. I found the following list:
beantragen, beanstanden, beanspruchen, beaufsichtigen, beauftragen, bemitleiden, benachrichtigen, bevormunden, bevorraten, bevorrechten, bevorzuschussen, bevorzugeilen, bevorzugen, veranlagen, veranlassen, veranschaulichen, veranstalten, verausgaben, verauslagen

What is surprising is the order of the prefixes; the separable one is always closer to the verb root than the other. If we took them to be generated higher, German would also be an example of inverted prefix order.

Interesting also is the fact that in nearly all cases there does not exist a verb with only one of the prefixes:
It appears quite plausible that this class of verbs does not exemplify cases of two verbal prefixes but instead denominalisation of deverbal nouns.
Given these facts, the separable prefixes seem to be a counterexample only at first sight. They are not real prefixes and therefore can be separated from the verb. This means we do not expect an internal structure where the prefix sits in the specifier of the VP, shown here with the verb "anziehen":

But on the other hand the meaning of the whole expression is not compositional. We cannot simply add the meanings of "an" (preposition) and "ziehen" (to pull) to get something like "to put on". Maybe there is a more complex structure in the lexicon which comprises both verbal root and prepositional prefix, together with a tree structure.
This would permit the verb root to move up higher to other affix positions. But the "prefix" has to follow cyclically. The verb would rise to the specifier from where it would attract the participal "ge-" prefix and the "an-" prefix would follow to an even higher position. Since the participle affix in German is realized as a circumfix, we could posit an overt suffix in the head to which the verb root is attracted:

Movement of the verb:
Now the PrefP cannot move directly up to the specifier of the VP, because it would take the PP with it and we would end up with the order: *ge-an-zieh-en. (The alternation from "zieh" to "zog" in the correct form "an-ge-zog-en" is due to allomorphic processes, which are not of interest here). To get the correct word order we have to move the PP first up to the specifier of a higher projection XP with an empty head X:

```
XP
-|-
Pp  PreP
   -|-
P      V'
       -|-
Pp'en
       -|-
Pp'an-
       -|-
-zieh
```

Now we could move the PrefP with the prefix "ge-" into the specifier position of the verb and arrive at the correct order: "an-ge-zieh-en" with "ge-zieh-en" corresponding to a word. But this last move would violate the cyclicity constraint by not moving to the highest position available in the actual derivation. Or in other words, it would be moved to a position below another moved element. The only way out of this dilemma is to "park" the PP between the suffix and the prefix place, then we can move the prefix. An additional move of the PP would give us the right order. But first we have to move the VP to a position above the PP and below the PrefP.

Let us start with the "VP shell" and an intermediate landing position fo the VP above:

```
ZP
-|-
Z     PP
   -|-
Pp
   -|-
Pp'an-
   -|-
V'
   -|-
V
      -|-
V'
```

First the verb moves up to the intermediate position in spec ZP:

Next the PrefP is merged, followed by the Merge of the intermediate landing position YP for the PP:

The prepositional phrase is now available for cyclic movement to its intermediate position in the space between prefix and suffix.
Now the SuffP will be merged and attracts the VP into its specifier. As mentioned before, this can be either as pure VP, extracting from the ZP as specifier, or as a component of the ZP. I chose here the second variant in order to be consistent in using only complement movements. But note that this is the only step where there is a choice.

The Prefix is now attracted to the specifier of the Verb:

\[
\text{an-} \quad \text{ge-} \quad \text{Z'}
\]

\[-\text{zieh}\]
Finally the last projection XP is merged, which attracts the PP (here again the choice between specifier movement of PP or complement movement of YP) to its specifier:

This gives us the right order "an-ge-zieh-en" which, after a phonological (or lexical) transformation, becomes "angezogen".

In order to respect the cyclicity constraint various intermediate positions were added. This seems at first sight a prize too high to pay.

One of the intermediate steps was reserved for verb movement, which highly resembles the old interpretation of head movement. It seems that the verb on its way up moves cyclically through many intermediate positions. If we want to eliminate head movement this behaviour must be mimiced in a certain way.
The intermediate position for the PP presents more of a problem. We will see, however, in chapter 5 that there are many independent reasons for assuming this position. It seems that for each modifier corresponding to the Cinque hierarchy (and the extended functional projection which is correlated with the past participle is one of these) we have to assume a much larger extended projection than assumed before. Apart from overt material (like the prefix "ge"), there are landing positions for the verb and landing positions for lower modifier material (the PP) in this case. The latter could be responsible for establishing a predication relation between modifiers and events. Here it suffices to notice that this position is made necessary by the idea of assigning affixes in syntax and the Cyclicality Constraint on one side and the ordering of (separable and real) affixes in German.

3.6 Derivation of the inverted order of prefixes

Deriving the inverted order for prefixes seems to be more of a problem, because the prefix which is in the basic order syntactically closest to the verb phrase, does not appear closest to the verb on surface order. On the contrary, the closest prefix is generated on top of the others. Languages that exhibit this pattern seem to be rare, though Navajo is considered one of them. M. Speas gives following examples:

At'ééd  ashkii  yidoots'qs.
   yi-do-o-0-ts'qs
   girl  boy  3Obj-Asp-Nonpast-3Subj-will:kiss
   'The girl will kiss the boy.'

Shiínígháád.
  shi-0-i-ni-gháád
  1sgObj-Asp-Past-2sgSubj-shook
  'You shook me.'

(Speas (1991,390))

We invariably get the order: AgrObj – Aspect – Tense – AgrSubj – Verbroot
Even if we don’t regard the agreement morphemes as part of the Cinque Hierarchy, tense and aspect are in reversed order in front of the verb. Refering to Ouhalla (1990) Speas mentions also Berber and Arabic as potential candidates for this type of language and cites his examples:

**Berber**

Ad-y-segh  Mohand ijn  teddart.
will(TNS)-3Masc:Sg(Agr)-buy  Mohand  one  house
'Mohand will buy one house.'

**Arabic**

Sa-y-ashtarii  Zayd-un  dar-an.
will(TNS) – 3Masc:Sg(Agr)-buy  Zayd-NOM  house-ACC
'Zayd will buy a house.'

(Speas (1991,393) and Ouhalla (1990,106))
Both languages have the order Tense-Agr$_{\text{Subj}}$ – verb root. But the agreement morphems behave differently compared to the morphemes of the Cinque Hierarchy as we saw above in the introduction to this chapter. Thus I would be careful to establish morpheme ordering just by comparing one of the Cinque morphemes with an agreement morpheme. Ouhalla gives additional data of Berber which justifies the doubt in putting this language into the set of languages with inverted prefixes:

\begin{verbatim}
ad-y-ttw-attef  uxwwan  dudsha.
will-3ps-PASS-catch  thief         tomorrow
'The thief will be arrested tomorrow.'
\end{verbatim}

(Ouhalla (1990,93))

Here we have the affix-order Tense – Agr – Voice – verb root. Tense is much higher in the Cinque Hierarchy than Voice which gives evidence for a direct prefix order. But at least Navajo seems to be a candidate with the correct properties. Given that most languages have a morphology where morphemes that correspond to lower functional projections are closer to the verb stem, this behaviour is unexpected. Speas offers three possible analyses, which all share the same order of syntactic projections above the VP:

\begin{align*}
\text{Agr} & \rightarrow \text{TP} \rightarrow \text{AP} \rightarrow \text{Agr$_{\text{O}}$P} \rightarrow \text{VP}.
\end{align*}

The Lowering Analysis: The affixes are generated in the heads of the appropriate functional projections. They move downwards and suffix to the next lower head until Agr$_{\text{O}}$P. Finally the whole complex prefixes to the verbal head. It is not clear why we have this asymmetry between suffixing and prefixing. Even worse is the movement analysis. Lowering leaves ungoverned traces which nowadays are excluded by nearly all variants of generative syntax. Speas, also, discards this analysis.

The Long Head Movement Analysis: The head moves across the other morphemes directly in a one step move to adjoin to the (empty) C-head. The rest of the affixes rise in an affix hopping manner to combine with each other. Together they prefix to the V-C-complex. In order to allow for the skipping, the HMC must be weakened in such a way, that certain heads don't count as possible interveners. There is also no syntactic motivation as to why we have suffixing in one case and prefixing in the other.

The Checking Analysis: This analysis can be seen as a predecessor to Chomsky's minimalist approach. The affixing takes place in the lexicon before inserting into the base structure. During the syntactic derivation the verb moves up to check its morphological features. This rising can take place after Spell Out (as in the case of Navajo). Languages with prefixes in direct order exhibit the lucky case where the checking goes from the outside to the inside.

... features are checked from the outside in, as though features of the head of the entire complex are checked and then 'peeled off', saturated, discharged or whatever.

(Speas (1991,409f))

Unfortunately these languages are the only ones. Verbs with suffixes in inverted order or prefixes in direct order have to check from the inside to the outside. Attempts to correlate the directionality of checking with the time of verb raising failed. Speas expected languages with verb movement after Spell Out to check from the outside to the inside. Unfortunately, languages like Japanese which have the verb rising after spell as well do not reveal the same affix order as Navajo. Speas mentions another problem with checking theories:
The sort of cases that become problematic are those in which GF-changing morphology is supposed to be amalgated through syntactic incorporation. Since inflectional morphemes generally appear outside of GF-changing morphemes, a syntactic incorporation theory for GF-changing morphemes is incompatible with a theory in which inflection is added in the lexicon.

(Speas (1991,410))

The Lowering Analysis is not compatible with the antisymmetric framework presented here. The Checking Analysis, however, is not based on particular assumptions about phrase structure. Since we have no idea how the checking correlates to syntactic derivation, I will not deal with this analysis here, but it could be interesting to see, whether and how the Long Head Movement Analysis could be modelled in terms of pure XP-movement. Instead of the verb moving to adjoin to another head (whether this is C or something else does not play any role for the argument) the entire VP moves via XP movement to a higher spec position. In contrast to the long head movement, there are no conceptual difficulties with intervening heads.

The affixes cannot simply move up after this VP-movement because this would be a strict violation of the Cyclicity Constraint. If the whole tree of affixes first moves into the specifier of the VP (prefixing) and then the single affixes rise via XP-movement inside the tree, we get a less problematic derivation. To exemplify, I start with a structure containing a VP at the bottom and two affix-projections on top. As a next step a higher XP is merged, which I take to be some part of the left periphery. XP attracts the VP:

\[
\begin{align*}
\text{XP} & \quad \text{VP} \\
\text{V'} & \quad X' \\
\text{V} & \quad \text{Suff}_1\text{P} \\
\text{-V} & \quad \text{Suff}_1' \\
\text{Suff}_1 & \quad \text{Pref}_1\text{P} \\
\text{Pref}_1' & \quad \text{Suff}_3\text{P} \\
\text{Pref}_1 & \quad \text{Suff}_2' \\
\text{Pref}_1' & \quad \text{Suff}_2 \\
\text{Pref}_2 & \quad \text{tvp} \\
\text{Pref}_2' & \quad \text{pref}_2- \\
\end{align*}
\]

The whole affixal complex (Suff$_1$P) is attracted to the specifier of the VP:
Now Suff$_1$P (which corresponds to PREF$_1$P in the above derivation!) attracts Suff$_2$P (the former PREF$_2$P):

This gives the right inverted prefix order as expected. Note that it makes no difference whether we have overt elements under the Suff-head, corresponding to suffixes, or overt
elements under the Pref-head, corresponding to prefixes. In both cases the derivation would be the same. However it seems odd to have movements inside the subtree of a specifier. Though theoretically possible, this would be a new kind of derivation, which, for the moment, I would like to avoid. Furthermore, this derivation raises the question as to why the Suff₁P does not attract the Suff₂P at an earlier point of the derivation, when the full (overt) VP is still sitting in the complement position of the Pref₂P. This is a violation of the rule "attract as early as you can" which we can view as a variant of the Cyclicity Constraint. For these reasons I don’t consider this type of derivation a valid solution.

To avoid the cyclicity violations, we have to move the VP cyclically up as in the case of ordinary prefixing. The difference is that the attraction of the lower prefix to the spec of VP is blocked.

We start with the VP below and one extended affix projection above:

```
  Suff₂P
    ↑
  Suff₂'
    ↑
  Pref₂P
    ↑
  Pref₂'
    ↑
      VP
        ↑
      Pref₂
        ↑
      pref₂-
```

As usual (as in ordinary suffixing an prefixing) the VP is attracted to the specifier of SuffP:

```
  Suff₂P
    ↑
      VP
        ↑
      Suff₂'
        ↑
      Pref₂P
        ↑
      Pref₂'
        ↑
        V'
          ↑
          V
            ↑
            V'
              ↑
              -V
```

This time the attraction of the PrefP to the spec of VP is blocked. The next prefix projection is merged instead:
This Pref\textsubscript{1}P can this time attract directly the Pref\textsubscript{2}P, which hops around the VP:

\[
\begin{align*}
\text{Pref}_1P & \quad \text{Pref}_1' \quad \text{Suff}_2P \\
\text{Pref}_2P & \quad \text{Pref}_1 \quad \text{Suff}_2' \\
\text{Pref}_2' & \quad \text{Pref}_2 \quad t_{VP} \\
\text{Pref}_2' & \quad \text{pref}_2\quad \text{VP} \\
\text{VP} & \quad V' \\
\text{V} & \quad V \\
\text{t}_{VP} & \quad \text{pref}_2 \quad \text{VP}
\end{align*}
\]

Now the second part of the affix\textsubscript{2}- projection is merged, the Suff\textsubscript{1}P:

\[
\begin{align*}
\text{Suff}_1P & \quad \text{Suff}_1' \\
\text{Suff}_1 & \quad \text{Pref}_1 \quad \text{Pref}_P \\
\text{Pref}_1' & \quad \text{Pref}_1 \quad \text{Suff}_2P \\
\text{Pref}_2P & \quad \text{Pref}_1 \quad \text{Suff}_2' \\
\text{Pref}_2' & \quad \text{Pref}_2 \quad t_{Pref2P} \\
\text{Pref}_2' & \quad \text{pref}_2 \quad \text{VP} \\
\text{VP} & \quad V' \\
\text{V} & \quad V \\
\text{t}_{Pref2P} & \quad \text{pref}_2 \quad \text{VP}
\end{align*}
\]

Suff\textsubscript{1}P can attract the Suff\textsubscript{2}P which carries along the verb:
This derivation continues cyclically until all prefixes are passed. At the end they are all in inverted order to the right of the verb. The last step moves the Pref1P to the specifier of the VP. Without losing generality I present the case of only two prefixes.

This derivation is very close to the prefix derivation. The major difference is that only the highest prefix can be attached to the verb. We can imagine that every functional PrefP has a property which determines whether it can be attracted to the verb or not. This would be a perfect parameter in the sense of Kayne(2003).
If all of the PrefPs had this property, the lowest would be attracted to the VP and occupy this position, so the others cannot go there. Thus, we can only detect the lowest in the sequence of prefixes which can be attracted to the VP. If this is the right way of thinking, then we expect languages where the lowest PrefP that can be attracted is neither the lowest prefix of all, nor the highest, but some prefix inbetween. Let's assume we have a sequence of four prefixes, where the second (from below) has this property, but the lowest does not. The value of this parameter for the prefixes above does not play any role. The derivation in this case would be absolutely equal to the one above until the two lowest prefixes are moved to the spec of the VP. With a little renumbering we get:
Pref₂P cannot attract any PrefP, because they are too imbedded in the specifier. Suff₂P can attract Suff₃P:
Now the Pref₄P is in a position from where it can attract the Pref₃P:

The last extended affix projection is merged and its Suff₁P attracts the lower Suff₁P: pref₂₇
and the $\text{Pref}_1P$ can be attracted to the $\text{Pref}_2P$. 
This gives us the order pref₁- pref₂- pref₄- pref₃ – verb root, or more generally the direct order of prefixes up to a certain point followed by reverse order followed by the verb root. To my knowledge so far no language has been detected, that exhibits this pattern. If this pattern would be found in a natural language, this would be, indeed, a fact in favour of this kind of derivation.

Now I want to present a much simpler idea which could explain the facts of Navajo and related languages. The affixes that appear in front of the verb are in inverted order, something which happens with suffixing. One might think that in fact they are suffixes of an empty head. The prefixed verb would be in reality a complex of an inflected auxiliary, whose root is unpronounced followed by the lexical verb in infinite form. Let us take the Navajo example from before:

Shíínígáád.
shi-0-i-ni-gháád
1sgobj-Asp-Past-2sgsubj-shook
'You shook me.'

We might interpret it as

Shííní gháád.
Aux-shi-0-i-ni gháád
Aux-1sgobj-Asp-Past-2sgsubj shake
'You shook me.'

where the Aux is an unpronounced auxiliary. This reduces the problem to simple, ordinary suffixing. This hypothesis is in perfect agreement with Kornfilt's analysis of certain Turkish verb forms as verb auxiliary complexes, which were previously considered simple verbs. In Kornfilt(1996) she compares two types of inflected verb forms, "genuine verbal forms", i.e. Definite Past and Conditional, and "fake tenses", which constitute more or less the rest. I want to exemplify the difference of these two for the verb "git" (go) with the paradigms of the definite past as a representative of the genuine forms and the paradigm of the future for the fake forms:
The accent represents stress, which is usually word final in Turkish. There are two striking differences between the two groups. First, the agreement morphemes are a bit different; second, the stress patterns are not alike. In the first group the stress is always on the last syllable as expected. In the second group we find the stress at the last syllable of the tense morpheme. Kornfilt's explanation is simple and convincing. What seems to be a simple inflected verb form in the second group is, in fact, a complex of a participle and an inflected auxiliary.

She argues, that in Turkish the copula in the present tense is phonetically empty, a phenomenon that is found in many other languages, (e.g. Russian). The difference between the agreement morphemes is due to the difference of the selecting verbs. The stress pattern in the second group becomes regular if we add a rule that deletes final word stress of a word that is cliticized to another word. And so we get for the second group:

<table>
<thead>
<tr>
<th></th>
<th>Definite Past</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.sg</td>
<td>git – tí – m</td>
<td>gid – ecég – im</td>
</tr>
<tr>
<td>2.sg</td>
<td>git – tí – n</td>
<td>gid – ecég – sin</td>
</tr>
<tr>
<td>3.sg</td>
<td>git – tí – Ø</td>
<td>gid – ecég – Ø</td>
</tr>
<tr>
<td>1.pl</td>
<td>git – tí – k</td>
<td>gid – ecég – iz</td>
</tr>
<tr>
<td>2.pl</td>
<td>git – tí – níz</td>
<td>gid – ecég – siniz</td>
</tr>
<tr>
<td>3.pl</td>
<td>git – tí – lér</td>
<td>gid – ecég – ler</td>
</tr>
</tbody>
</table>

'go' – Past – Agr<sub>S</sub>  
'go' – Fut. – Agr<sub>S</sub>

Regarding stress the two parts behave like two words, where the second is cliticized on the first. With respect to vowel harmony, they behave as one word. The root vowel dictates the set of vowels for the whole group. Kornfilt writes:

*The values for the backness and rounding features of all regular suffixes, irrespective of whether they are derivational or inflectional and irrespective of their category features, are not specified; these two values are determined by VH, depending on the values of the harmony domain which spread from the initial vowel of that domain.*

(Kornfilt (1996,113))

She distinguishes between the "small word" which determines stress and the "word" which is the domain of vowel harmony. In the cases of the "fake tenses" the words are composed of two small words. This distinction resembles the subdivision of morphemes into two strata that we find in lexical morphology. Stratum 1 contains non-neutral affixes which when attached to the root, could change the word stress. Stratum 2 contains neutral affixes, which never change the stress of the base they are attached to. The common idea of lexical morphology was that stratum 1 affixes are attached to the root before stratum 2 affixes.
It seems unlikely that the analysis of Kornfilt can be generalised to all of these cases. An important question however is whether the distinction between the two types of affixation can be modelled structurally in the framework presented here. A close examination of the possible solutions would be beyond the scope of this work. I present here just some raw ideas.

So far the Axiom of Word Boundary is the only relevant definition, giving us some constraints in the search for a structural representation of affixation, leaving some freedom for the internal structure. Until now we had words that are represented as sequence of basic projections, sitting in a specifier of each other. The head of each basic projection bears either the root or a morpheme:

We could think of more complex structures where in the specifiers there are not just basic projections but larger constituents with the overt morpheme imbedded more deeply:
There is no word boundary between the empty copula and its specifier, which has the whole morphological material of the participle "gideceg". There is, however, a word boundary between the head X and its complement, which bears the same participle. What looks at first sight to be a contradiction could be, in fact, a possible way to stipulate different grades of word boundary.

Along these lines we might interpret the Navajo example as the cliticisation of an inflected unpronounced auxiliary to the root of the main verb. I repeat the relevant example here:

Shíínígháád.
shi-0-i-ni-gháád
1sgObj-Asp-Past-2sgSubj-shook
'You shook me.'

which I might interpret as

Shííní gháád.
Aux-shi-0-i-ni gháád
Aux-1sgObj-Asp-Past-2sgSubj shake
'You shook me.'

The auxiliary is base generated in a very low position and rises as AuxP up to the SuffPs above where the overt heads of the latter become Suffixes. The main verb either rises in one step to a position above the highest SuffP or cyclically around the single Aux–Suff-complexes. Finally a projection (let's call it XP) that dominates the inflected auxiliary moves up into the spec of the VP. The last configuration would be something like:

```
X
  | SuffP
  |     V'
  |       XP
  |         V
  |           V
  |             vgháád
  |               X'
  |                 X
  |                   Suff1P
  |                       Suff1'
  |                           Suff1
  |                               | Suff3
  |                               |         | Suff5
  |                               |         |         | Suff7
  |                               |         |         |         | Suff9
  |                               |         |         |         |         | Suff11
  |                               |         |         |         |         |         |    0
```

...
If this analysis turns out to be correct, then the question arises whether we can obtain a structure which seem to be superficially like a verbal root followed by suffixes in direct order, but is, in reality, the cliticising of a prefixed (empty) auxiliary to the moved verb. For the moment I see no reason, why this should be excluded, although, so far, no languages with suffixes in direct order have been described.

### 3.7 Fused Morphemes

So far we have seen affixation in the case of agglutinative morphology, where every morpheme corresponds to a single phonological element. I will rely on a definition given by W. Bisang (personal communication) who also refers to Haspelmath

"Kumulation (Flex) vs. Trennung (Aggl) von Funktionen:
In flektierenden Sprachen erfüllt ein Morphem oft gleichzeitig mehrere Funktionen, in agglutinierenden Sprachen erfüllt jedes Morphem nur eine Funktion
In fusional languages, each morpheme serves several purposes; in agglutinating languages, each morpheme has only one function.

Formale Varianz (Flex) vs. Formale Invarianz (Aggl) von Morphemen:
In flektierenden Sprachen variiert die Form der Morpheme - sowohl des Stammes als auch der Affixe (vgl. Allomorphie). In agglutinierenden Sprachen erscheinen die Morpheme konstant in der gleichen Form.
In fusional languages the form of morphemes (affixes and root) can vary, in agglutinating languages the form of morphemes is constant.

Diversität (Flex) vs. Einheitlichkeit (Aggl) von Affixen:
In flektierenden Sprachen werden für ein und dieselbe Funktion oft mehrere unter-schiedliche Morpheme verwendet, in agglutinierenden Sprachen wird die gleiche Funktion immer durch das gleiche Morphem ausgedrückt.
Fusional languages often use several different morphemes to express one function, agglutinating languages always use the same morpheme.

(Translations by me)
In this passage we find a tripartite distinction between morpheme, function and form, where morpheme seems intermediate between function and form. If "Kumulation" and "Diversität" are combined we get as definition for agglutinative languages, a one to one correspondence between function and form.

An example of a fusional language is Italian which I exemplify with the paradigms of the "imperfetto" and the "passato remoto". These two forms have the same tense feature, namely [+past], and are distinguished by a feature [-perf] for "imperfetto" and [+perf] for "passato remoto" ("perf" being an abbreviation for "perfective"). I choose the verbs "amare" (to love) and "temere" (to fear). The suffix "-re" marks the infinitive. For comparison, the present tense form are also shown.

<table>
<thead>
<tr>
<th>Presente</th>
<th>Imperfetto</th>
<th>Passato Remoto</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.sg</td>
<td>amo</td>
<td>amavo</td>
</tr>
<tr>
<td>2.sg</td>
<td>ami</td>
<td>amavi</td>
</tr>
<tr>
<td>3.sg</td>
<td>ama</td>
<td>amava</td>
</tr>
<tr>
<td>1.pl</td>
<td>amiamo</td>
<td>amavamo</td>
</tr>
<tr>
<td>2.pl</td>
<td>amate</td>
<td>amavate</td>
</tr>
<tr>
<td>3.pl</td>
<td>amano</td>
<td>amavano</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presente</th>
<th>Imperfetto</th>
<th>Passato Remoto</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.sg</td>
<td>temo</td>
<td>temevo</td>
</tr>
<tr>
<td>2.sg</td>
<td>temi</td>
<td>temevi</td>
</tr>
<tr>
<td>3.sg</td>
<td>teme</td>
<td>temeva</td>
</tr>
<tr>
<td>1.pl</td>
<td>temiamo</td>
<td>temevamo</td>
</tr>
<tr>
<td>2.pl</td>
<td>temete</td>
<td>temevate</td>
</tr>
<tr>
<td>3.pl</td>
<td>temono</td>
<td>temevano</td>
</tr>
</tbody>
</table>

The two verbs belong to different verb classes, those that end with "-are" and those that end with "-ere". The "-re" we already determined as an infinitive suffix. The vowel in front ("a" and "e") is a class suffix whose semantic value is not clear. It is not independent of the verb root, since we cannot combine class suffixes and roots in a free manner: *amere, *temare. Thus it must be somehow in the lexicon. I will return to this issue later.

Comparing the three forms, we can establish agreement morphemes (-o, -i, -0, -mo, - te, -no). However, we see that in the case of the 1st person plural present tense, 1st person singular passato remoto, the phonetic form is not easy to recognize, but this could be attributed to some phonological process.

For the imperfetto we can establish "v" as the determining suffix. This must somehow encode two features: [+ past] and [-perf]. We can infer, that one of the two features is realised by an empty phonetic form. Given the fact that we do not have any overt morpheme for the present tense([-past]) we could choose "v" to be the representation of the past morpheme. This gets support from the idea, that imperfectivity is the unmarked form. Then we expect to find the "v" in the passato remoto as well, since it shares the [+past] feature with the imperfetto. But we don't find it there. Even worse we don't find any phonetic form, that all morphemes of the passato remoto have in common (apart of the root and the class suffix). It seems that especially in this case tense features, aspect features and agreement features are fused into an entire phonetic complex, which cannot be subdivided into distinguishable morphemes.

In order to explain this phenomenon without giving up the idea of affixes in syntax, I will rely on an idea presented by Michal Starke at the East European Summer School 2002 in Novi Sad. As in many modern morphological theories such as Distributed Morphology, we can
assume a distributed lexicon. This assumption gets some support based on new result from neurolinguistic research.

One lexicon, Lex₁, lists all so called lexical elements such as noun or verb roots with their semantic and syntactic properties such as argument structure and thematic role selection. The entries to this Lex₁ are feature bundles, from which the numeration selects for insertion into the syntactic structure.

I take the set of functional elements such as [+past], [-epistemic] or [+perf] to be universal. As presented in Chapter 2, Kayne proposed to locate all parametric variation in properties of functional elements. If we want to follow this line, we have to fix these properties in lexical entries. Whether functional elements and feature bundles of verb roots are to be found in the same lexicon is another question, which has no effect on the ideas presented here.

The syntactic module operates with these entries and builds via Move and Merge a hierarchical structure that is passed over to a morpho-phonological module, which has access to another lexicon. This second lexicon, Lex₂, correlates syntactic structure including feature bundles in terminal nodes to phonological representations. Morpho-phonological rules form the phonetic string, which represents the sentence.

In the case of agglutinating morphology there will be an entry in Lex₂ for every root and for every morpheme. But for fused morphology there will also be entries for more complex syntactic structures. I agree with Starke's assumption that the morpho-phonological module first tries to retrieve bigger syntactic trees in Lex₂, before searching for smaller chunks. I want to describe this process in more detail for the representation of the 1st person plural, passato remoto for the verb "amare".

At the end of the derivation we can have a structure like:

![Diagram of syntactic and morpho-phonological structures]

The morpho-phonological module first searches in Lex₂ for the maximal entry. In this case this is the whole tree together with root and all suffixes. But the module won't find an entry. The next steps will be to look for entries for trees with "ama- +perf - +past" and "ama- +perf" which will not give a positive result. Only the search for "ama-" will be successful. The result is the phonetic string "ama-"

Now the module will look for the tree that comprises "+perf - +past 1st.Pl". This entry will also be empty. So the module will look for " +perf - +past". This time the search is successful and will reveal the phonetic string "+m-".

Finally the module has to look up the tree for "1st.Pl". It will return the string "+mo". Note, that in the representation of the last string there is no "-" to the right. This indicates that the morpheme closes the word.

Now the strings are concatenated and after some phonological processes (which in this case maybe redundant) the module produces the string "amammo".
This example should only serve to exemplify the assumed procedures. It is by no means meant to provide the correct morpho phonological correlations. In fact it might be more plausible that "-mmo" represents the fusion of the morphemes "+perf- +pass 1st.Pl".

There remains a small puzzle. In the 1st.sg and 2nd.sg forms of the present tense there is no trace of the class suffix. This becomes more surprising if we look at the forms of the "congiuntivo" (subjunctive):

<table>
<thead>
<tr>
<th></th>
<th>amare</th>
<th>temere</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.sg</td>
<td>ami</td>
<td>tema</td>
</tr>
<tr>
<td>2.sg</td>
<td>ami</td>
<td>tema</td>
</tr>
<tr>
<td>3.sg</td>
<td>ami</td>
<td>tema</td>
</tr>
<tr>
<td>1.pl</td>
<td>amiamo</td>
<td>temiamo</td>
</tr>
<tr>
<td>2.pl</td>
<td>amiate</td>
<td>temiate</td>
</tr>
<tr>
<td>3.pl</td>
<td>amino</td>
<td>temano</td>
</tr>
</tbody>
</table>

In the singular forms we do not find the class suffix at all. But the endings for the verbal form are determined by it. As already said, it does not give any semantic contribution. Furthermore the suffix seems to be part of the lexical representation. I assume that the representation of the verb root of "amare" is the following syntactic tree together with the features of "am":

![Syntactic tree for amare and temere](image)

This tree will be inserted as VP in the sentence and it will move up as one constituent to take the rest of its suffixes. In the case of the "congiuntivo" it will meet a suffix with the abstract features [+subj] before climbing further up to get the agreement suffixes. The resulting structure will be:

\[ \text{Suff}_1 \]
This time the module will find an entry for "am-" giving "am-" and an entry for ",a- +cong 1st.sg" giving "i". After concatenation we get "ami".

### 3.8 Arguments

So far I described only the movement of the verb in order to get its affixes attached. Including arguments, such as subject and object, complicates the picture.

In the case of pure suffixing the derivation can be extended straightforwardly. I choose the sentence "John loved Mary" where we can analyse the verb as composed of (at least) two morphemes: the root "love" and the tense morpheme [+past]. The root is inserted in the lowest part of the VP Shell. Above the root we find projections that host the object and the subject.

Abstracting away from agreement and other possible invisible modifiers the next level to merge is the extended projection of the past morpheme. First the empty PrefP is merged, then the SuffP with the past morpheme.
The verb moves into the suffix projection.

In the case of further morphemes above (abstract agreement), there must be a movement up of the two arguments prior to movement of the SuffP to the next SuffP. Further movements should give the correct word order (see also the discussion below).

Prefixing is the problematic case. After the verb is raised to the Suffix Projection position the Prefix Projection has to move to its specifier without any material below. The objects and the subject have to be moved up higher before the movement of the verb. So this material has to end up somewhere in the space between the SuffP and the PrefP. To exemplify I will take an example from Swahili, a language exhibiting a large number of class prefixes for nouns. Together with a tense morpheme we find these morphemes realised as prefixes in the order AgrS – Tense – AgrO – root. I will take a sentence from a lesson of W. Bisang, given in Mainz, 1995.
"Na" expresses agreement with the subject pro, which we expect before the verb, the usual place for subjects in Swahili. We assume a VP shell with the bare verb sitting in the lowest position. Above we find projections for the object and the verb.

We could next merge the PrefP of the extended AgrO-projection and above landing positions for the arguments. At a higher position the SuffP would be merged and attract the VP. Since the whole shell is empty we could either move up the whole VP Shell or only the lower V^2P with the verb. In the first case the resulting structure would be:
(LSP and LOP represent landing positions for the subject and the object.) Now we see that there is no place for the Prefix to move to. The highest specifier of the shell, the specifier of \( V^0 \) is occupied by the trace of the subject. Movement to the specifier of \( V^2 \) is impossible, since the moved element would not C-command its trace. An escape hatch could be to assume an empty projection above \( V^0 \), which is moved along with the shell. In this case the Prefix could attach to it, but we would end up with a structure like:

This is not the structure that we assumed to represent a word. Between "ki-" and "-ona" there are at least four word boundaries (between heads and complements). The second option was to move just the lowest element of the VP shell, the \( V^2 \) up to the specifier of the specifier of the SuffP:
As we see, there is no way to move just the PrefP up; it has to take the whole lower part with it, giving rise to the structure:

This structure is again ambiguous with respect to the word status of the prefix-root complex. There is no word boundary between the overt material in the specifier of \( V_2^0 \) and the root in the head, but inside the PrefP we find three word boundaries. This could indeed be a possible structure, but we expect to find some data that confirms this ambiguity. In the case of Turkish we saw that stress pattern is correlated with the "little word" where we have no internal word boundaries. Vowel harmony was spread over the whole "big word", which can have internal word boundaries.

We can avoid this ambiguous structure, if we restrict ourselves to complement moves. The verb has to move above the arguments before they can be raised into the space between SuffP and PrefP. This intermediate landing position of the verb must be below the PrefP, otherwise the PrefP cannot be moved cyclically into its specifier.
Now the PrefP can be merged and the landing positions for the object and the subject both attracting the corresponding arguments:
Now the SuffP can be merged and attract the LVP, which contains the verb:

Next the prefix attaches to the verb:
I will stop here, due to the repetitive nature of this derivation. It is easy to see, how the other two prefixes can be attached. An extended projection, consisting of SuffP – LSP – LOP – PrefP, will be merged for each Prefix. LOP will attract the lower LOP, LSP the lower LSP and SuffP the lower PrefP. The lower PrefP, now sitting in the highest specifier, attracts the PrefP of the actual extended projection.

This gives the order "na-li-ki-on pro kitabu" with the pro in the wrong position after the verb. Specifier movement could transpose it to the left of the verb. But there still seems to be something missing. We would like to correlate the positions of the subject and the object to certain projections inside the hierarchy of extended projections. Therefore, it would be necessary to determine the argument positions not only with respect to the verb, but also to modifiers. I will return to this issue later after having introduced prepositional modifiers. For the moment suffices it to say, that the arguments have to move into a space between the SuffP and the PrefP if we want to maintain the Cyclicity Constraint and the C-Command Constraint.

### 3.9 Open questions

We saw in this chapter how simple processes like suffixing, prefixing and circumfixing could be explained in a mainly syntactic analysis. Future research will show, whether this analysis can be used to explain more complex processes.

Infixed probably are not a homogenous group and might be explained in different ways. Sometimes the German "ge-" in participle constructions with separable prefixes is considered an infixed. Above we saw an example with the verb "an+ziehen" (to dress). The past participle is "angezogen". I showed above that "ge" could be analysed as an ordinary prefix, while "an" does not have a proper prefix status.

We find a different case of infixed in Tagalog. The subject focus affix "um" is usually realised as a prefix as in "um+alar" where it attaches to the root "alar". But with roots starting with a consonant the affix ends up inside the root. An example is "sumulat" for the root "sulat". Tagalog seems to prefer syllables without a coda. Therefor we could analyse "um" even in the case of "sumulat" as a prefix. Its appearance inside the root is attributed to some phonological process after syntax. (The examples are taken from Russel (1997,118))

More problematic are the cases of non-concatenative morphology. In modern German and English certain verbs have past tense forms that differ from the present tense form by the root vowel, a process which is known under the name of "ablaut". "I sleep" vs. "I slept" or "I run" vs. "I ran" are famous examples in English; in German we find "Ich schlafe" (I sleep) vs. "Ich schlief" (I slept) or "Ich laufe" (I run) vs. "Ich lief" (I ran). These processes are nowadays irregular and the corresponding form will be single entries in the lexicon.

But at an earlier stage and probably in Indo-European this formation was supposedly productive. If we want to understand the underlying process we have to compare carefully root vowels and changed vowels before we can attempt a generalisation. A possible explanation might be to assume an underspecified vowel as past tense affix. This element might consist of only a single phonetic feature like [+backness] which needs a vowel to be
pronounced. A morpho-phonological rule links this feature with the root vowel (which might be itself underspecified) with the result of changing its quality. More challenging are parts of semitic morphology which are commonly referred to as "template morphology". Verb roots in Arabic are clusters of three or four consonants. "ktb" is the root of the verb "write". These root consonants will be projected on a certain "skeletal tier" with vowels interspersed. "Kataba" with the meaning "he wrote" has the skeletal tier "CVCVCV". "Kattaba" means "he caused to write" and has the skeletal tier "CVCCVCV". The skeletal tier is associated with a grammatical function usually described as being derivative. Examples are "causative" and "reciprocal". The vowels provide information about tense and aspect. Future research might show whether a combination of affixal syntax and prosodic phonology can derive a plausible analysis of the involved processes.

3.10 Conclusion

In this chapter I proposed an analysis, which accounts for the assignment of affixes to the verb via XP movements. I assume there to be different lexicons. One contains a list of all lexicon items together with their syntactic properties. Functional elements are supposed to be universal, but their syntactic properties can differ from language to language. Therefore I assume that they are also part of this lexicon. It is this lexicon from which elements are taken to feed the numeration. Merge and Move give rise to a morpho-syntactic structure, represented by a binary tree. A morpho-phonological module translates this tree into a phonetic string. It has access to a second lexicon where we find a correlation between tree chunks and phonological representations.

Certain typological observations indicate a correlation between syntactic properties and the order of affixes. This led me to the idea that the difference between prefixing and suffixing is attributed to different syntactic processes. From this basic assumption I deduced a model that proposes for each affix an extended projection with rich structure. From this basic assumption I deduced a model that proposes for each affix an extended projection with rich structure. Suffixes are inserted in a very high part of the projection, prefixes in the lowest. In between we find landing positions for overt material from below such as subjects, objects and prepositions. This rich structure follows automatically from few restrictions on structure (being antisymmetric) and movement (Cyclicity Condition and C-Command Constraint). The transformational processes involved consist mainly of movements out of complement positions. If we could generalise this to a universal constraint, which prohibits head movement and specifier movement, we would have a very restrictive theory. The Axiom of Word Boundary, which I introduced here in a stipulative way, could be derived by explicitly forbidding specifier movement.

In the next two chapters I want to explore in an analogous way the syntactic behaviour of prepositional modifiers. First I will give motivation for assuming a basic order of different PP types. I will introduce some syntactic test, which I used with German sentences. In the following chapter I try to explain how we can derive different surface orders in English and German from the same basic order. We will see whether and/or how we can combine the structural and derivational analysis for affixes and prepositional modifiers.
4 The Order Of Prepositional Phrases in German – Empirical Observations

4.1 Introduction

German syntax with its relatively free word order has always challenged generative grammarians. It could neither be characterised as being clearly as superficially SVO nor SOV, because in main clauses the verb appears in second position and in dependent clauses at the end. The first property was responsible for the name “verb second language” the last for claming German to be basically a SOV language. In main clauses the verb moves to the head of the CP, a position that is blocked by a complementizer in dependent clauses.

Additional difficulties arise from the fact that in German arguments can move around with a high degree of freedom. Perfectly grammatical are the following sentences:

Hans gab seiner Freundin einen Blumenstrauß.
Hans gave (his girl friend)+DAT a bunch of flowers
Hans gave a bunch of flowers to his girl friend.

Seiner Freundin gab Hans einen Blumenstrauß.
Einen Blumenstrauß gab Hans seiner Freundin.
Hans gab einen Blumenstrauß seiner Freundin.

The translation is always the same, but the topic-focus structure is different. Only the first sentence is neutral and can be answered out of the blue or as an answer to a question like "What happened?".

The second sentence puts "Seiner Freundin" into a position of contrastive topic; "einen Blumenstrauß" can be interpreted as topic. Together they can be seen as part of list of answers to the question:

Wem hat Hans was gegeben?
Who+DAT has Hans what given
To whom did Hans give what?

Seiner Freundin gab Hans einen Blumenstrauß.
Seiner Mutter gab Hans eine Porzellanfigur.
Hans gave a porcelain figure to his mother.

If we find "einen Blumenstrauß" in the first position, it can be either a topic or a contrastive focus. In the first case it takes up a theme, which has already been introduced. The second case sets the accusative object into a contrast to other options, such as: "it was a bunch of flowers that he gave to his girl friend, not a ring".

The last sentence gives emphasis to the "Blumenstrauß". It can be understood as the answer to the question "What did Hans give to his girl friend". The "Blumenstrauß" bears extra stress.

Sentences where the subject is neither in first position nor directly after the verb are ungrammatical or at least very marked:

* Seiner Freundin gab einen Blumenstrauß Hans.
* Einen Blumenstrauß gab seiner Freundin Hans.
Given the different pragmatic interpretations and the different intonation structures with the grammatical sentences there is no doubt about the unmarked order base order Subject > Indirect Object > Direct Object. If it comes to prepositional phrases, establishing an order among different types becomes extremely difficult. Even languages with relatively rigid word order like English show some liberty with respect to PPs. Of the following two pairs both word orders are considered grammatical. But of each pair the first sentence seems to be less marked.

**Temporal - Locative**
- Hans slept in Munich on Sunday.
- Hans slept on Sunday in Munich.

**Instrumental – Temporal**
- Hans repaired the radio with the screwdriver on Friday.
- Hans repaired the radio on Friday with the screwdriver.

If we follow the assumption that in English, or more generally in VO languages, we find PPs in inverted order following the verb, this gives us the basic order:

**Temporal > Locative > Instrumental**

But the judgement of the difference in markedness is very weak and gives no clear coherent overall basic order. The whole corpus can be found in the Appendix C.

In German, the order between PP types seems to be even more liberal. We thus find the following order both acceptable and both seem to have the same interpretation.

Ich habe für Herrn Mayer im Garten gearbeitet.
I have for Mr. Mayer in the garden worked
I worked in the garden for Mr. Mayer

Ich habe im Garten für Herrn Mayer gearbeitet.
I have in the garden for Mr. Mayer worked
I worked for Mr. Mayer in the garden.

Most German speakers would not give any preference to one of the two sentences. Furthermore, both can be answers to the question "For whom did you work in the garden?". But it would be precipitous to deduce that they have identical information structure. If we change the question and ask for the other PP constituent "Where did you work for Mr. Mayer?" the second sentence becomes slightly degraded as an answer to it. This asymmetry is well known for arguments in German. We can take the first example and ask "To whom did Hans give a bunch a flowers?". From the two examples with both PPs in the 'Mittelfeld' (to the right of the finite verb), both can be given as answers:

Hans gab seiner Freundin einen Blumenstrauß.
Hans gab einen Blumenstrauß seiner Freundin.

But if we ask "What did he give to his girl friend?", only one is an appropriate answer:

Hans gab seiner Freundin einen Blumenstrauß.
* Hans gab einen Blumenstrauß seiner Freundin.
This example shows that the search for an unmarked order between PPs is not an easy task. It is not sufficient to ask for judgements about which order is preferred. We have to look for more subtle tests.

Another obstacle is the proper analysis of the status of the PP in question. As we have seen in the first chapter there are cases where the PP is selected by the verb and has a status similar to an argument. The German verb "liegen" (to lie) selects a locative PP, which cannot be left out:

Hans liegt im Garten.
'Hans lies in the garden.'

* Hans liegt.

The same PP can have a pure modificational status in other sentences and can be omitted without any problem:

Hans arbeitet im Garten.
Hans works in the garden.

Hans arbeitet.

There is another important syntactic difference between the two types of PPs. Pure modificators can be found in the 'Nachfeld', the space behind the right verb bracket. Arguments are excluded in this position:

Hans hat gearbeitet im Garten.
* Hans hat gelegen im Garten.

If we stick strictly to pure modifying PPs we will see, that they obey a restriction that cannot be explained by any adjunction theory: we cannot find two PPs of the same type in the same sentence together. Two Benefactives, two instruments, two PPs of matter cannot appear together:

* Hans arbeitete für Herrn Mayer für Herrn Müller.
* Hans worked for Mr. Mayer for Mr. Müller.

* Hans arbeitete mit einem Hammer mit einem Meißel.
* Hans worked with a hammer with a chisel.

* Hans sprach über Geschichte über Literatur.
* Hans talked about history about literature.

The ungrammaticality of these sentences cannot be deduced from semantic constraints. Conceptual there is nothing which forbids to have two people that somebody can work for. Hans can use two tools at the same time and can talk about more than one subject. The sentences become grammatical if we coordinate the PPs:

Hans arbeitete für Herrn Mayer und für Herrn Müller.
Hans worked for Mr. Mayer and for Mr. Müller.
Hans arbeitete mit einem Hammer und mit einem Meiβel.
Hans worked with a hammer and with a chisel.
Hans sprach über Geschichte und über Literatur.
Hans talked about history and about literature.

This behaviour can easily be explained if we assume that there is only one syntactic slot for each PP type. But this does not suffice. In a minimalist framework without the restrictions of antisymmetric structure we could adjoin as many benefactive PPs to the benefactive functional projection or to another projection as we would want. The fact that we have to use a coordinate structure indicates that we can insert only one single constituent into the appropriate slot. This is exactly what we expect in an antisymmetric world.

There seem to be some apparent counterexamples with temporals and locatives:

Ich traf Hans in Italien in Venedig.
'I met Hans in Italy in Venice.'

Wir treffen uns am Dienstag um 8 Uhr.
'We will meet on Tuesday at 8 o'clock.'

But the two locative PPs in the first sentence cannot be interpreted as two (independent) modifiers of the same event. I did not meet Hans twice, once in Italy and once in Venice. Venice is not modifying the event, it gives a more specific description of the place where the single meeting took place. "in Italien" gives a rough description of the place, which becomes more specific by "in Venice".

The same is valid for the temporals in the second sentence: "am Dienstag" gives a more general description of the time, "um 8 Uhr" specifies this description.

If we exchange the order of the PPs in the first sentence we get another interpretation:

Ich traf Hans in Venedig in Italien.
'I met Hans in Venice in Italy'.

Here "in Italien" does not give a fine graining of the place already determined by "in Venedig". We neither get the same interpretation as in the reversed case. "in Venedig" is not a fine graining of "in Italien". What is meant by this sentence is a contrastive determination of "Venedig". "I met Hans in the Venice which is situated in Italy, not the one which is in the United States". I claim therefore that in the case of "Ich traf Hans in Italien in Venedig", the second locative PP modifies the first locative PP, whereas in the case of "Ich traf Hans in Venedig in Italien", the second PP modifies the DP "Venedig".

The different structures can be exemplify with exposition to the 'Vorfeld'. While it is possible to raise a PP which is modified by another PP into the Vorfeld

In Italien traf ich Hans in Venedig.

this is not possible with the PP whose DP is modified by a PP:

* In Venedig traf ich Hans in Italien.

This shows, that the modifying PP in the second sentence is deeper imbedded. I assume that the extended projection projected by the modified noun is sitting in a specifier position with all its modifiers. The extended PP however is scattered along the main projection line and therefore parts of it can be left out.
That we have the same restrictions for locatives and temporals as for other types can be seen by putting two locatives or temporals of the same scale in one sentence:

* Ich traf Hans in Italien in Frankreich.
 * 'I met Hans in Italy in France.'

* Wir treffen uns am Dienstag am Mittwoch.
 * 'We will meet on Tuesday on Wednesday.'

Of course these sentences can be repaired by adding a coordinator:

Ich traf Hans in Italien und in Frankreich.
Wir treffen uns am Dienstag oder am Mittwoch.

I hope the above remarks make clear, that the establishing of an unmarked basic order of PPs is not a straightforward task. My first approach to collect judgements of preference of word orders was a complete failure. I collected data from different languages, among them German, English, Italian, Finnish, Hungarian, Russian. But it turned out, that they did not result in any coherent basic order. The same speakers could give different judgements for the same couple of PPs if presented in a different syntactic context. I had to look for more subtle syntactic tests.

But before presenting these tests I want to give a short overview of the general sentence structure of German.

A short description of certain tests for German or other languages follows. It turned out, that not all tests were usable for German. I will try to account for why this is so.

I will add a short discussion about sentence structure and word order in the German 'Mittelfeld' that can be found in the literature.

The following section will introduce my own empirical findings. I used extensively three tests which in fact gave surprisingly consistent results. I will discuss them in more detail; the data can be found in Appendix A.

At the end of the chapter I will represent the results and some statistical evaluations.

### 4.2 General Remarks on German Sentence Structure

As stated above the German main clause has two distinct positions for verb. In second position we find the finite verb or finite auxiliary. All infinitives and participles are to be found in a position after all arguments and normally all modifiers. These two positions form the "verb bracket" of the German sentence.

Hans spielt fröhlich mit dem Ball.
Hans plays happily with the ball
'Happily Hans plays with the ball.'

Hans hat fröhlich mit dem Ball gespielt.
Hans has happily with the ball play+Part
'Happily Hans played with the ball'

In dependent clauses with an overt complementizer all verbs are in the right verb bracket position:

Ich glaube, dass Hans mit dem Ball spielt.
I believe that Hans with the Ball plays
I believe that Hans plays with the ball.

Ich glaube, dass Hans mit dem Ball gespielt hat.

In first position we find fronted elements in topic or focus position and wh elements. They form one single constituent and this region is called 'Vorfeld'. In the case of neutral topic-focus structure and if the sentence contains temporals or higher modifiers they will usually occupy this space, otherwise the subject will be there.

Am Samstag hat Hans mit dem Ball gespielt.
'On Saturday, Hans played with the ball.'

Angeblich hat Hans mit dem Ball gespielt.
'Allegedly Hans has played with the ball.'

Wann hat Hans mit dem Ball gespielt?
'When did Hans play with the ball?'

The right verb bracket usually constitutes the end of the clause, but in spoken language we find very often destressed modifiers, also elements that can be analysed as afterthoughts. This part of the sentence is called 'Nachfeld'. Arguments can never be found here.

Hans hat im Park mit dem Ball gespielt.
Hans hat im Park gespielt mit dem Ball.
Hans hat mit dem Ball gespielt im Park.

The region between the two brackets is the so-called 'Mittelfeld'. Here we usually find all modifiers and the objects. And it is this part, which gives us information about the unmarked order.

4.3 Potential tests for finding the base generation of phrases

4.3.1 Infinitival Complex

This is a test, that is used by Heidolph (1981). It is assumed to give the unmarked surface order of constituents in a German sentence. The idea is to compare complexes of modifiers, arguments and an infinitival verb. The criteria for non-markedness are:
- the elements have not yet been introduced. This way they cannot be information topics, which might locate them in a different position.
- all DPs are indefinite. The authors correlate this with the first criterion. An indefinite DP cannot refer to an element introduced before. Furthermore it is known, that definite objects move higher:

Hans hat seiner Freundin ein Buch geschenkt.
Hans has (his girl friend) +DAT a book (give as a present)+ PART
'Hans has given a book to his girl friend as a present.'

? Hans hat ein Buch seiner Freundin geschenkt.
? Hans hat seiner Freundin das Buch geschenkt.
Hans hat das Buch seiner Freundin geschenkt.
- there is only one main intonation stress
- the last constituent before the "Engere Prädikatsgruppe". This seems to be more or less the set of obligatorily selected elements, but not direct or indirect object. Resultatives or directional arguments are examples.

With the help of these criteria the authors try to establish ordering relations between unmarked constituents. They give the following example for unmarked order:

mit einem Füller einem Schüler eine Note in ein Heft schreiben.
with a pen (a pupil)+DAT a grade into an exercise book write
'to write a grade into a booklet of a pupil with a pen'

einem Jungen ein Buch geben
(a boy) + DAT a book give
'to give a book to a boy'

as opposed to

? einem Schüler in ein Heft eine Note mit einem Füller schreiben
? ein Buch einem Jungen geben.

(examples from Heidolph (1981,707), expressions in bold bear main stress).

Given the fact that many other factors besides topicalisation influence the intonation structure this test does not seem to be clear enough purpose. Though it seems to work fine for the examples above, I couldn't establish an ordering among PPs even in cases that ought to be clear. Comparing temporals with locatives does not give a clear result, though other test show, that temporals are clearly higher:

an einem Wochentag in einem Park spazieren gehen
on a week day in a park walk
'to walk in a park on a weekday'

in einem Park an einem Wochentag spazieren gehen.

The same problems arise with locatives and instruments:

in einem Büro mit einem Computer arbeiten
in an office with a computer work
'to work with a computer in an office'

mit einem Computer in einem Büro arbeiten

4.3.2 VP-topicalisation

In Nilsen (1998,63ff) we find the following observation. In Norwegian, which is also a verb second language, complexes of a lexical verb and modifiers can be moved in front of the finite auxiliary. If we have two modifying PPs we get certain restrictions which can be seen in the following examples:

[Motte henne] gjorde jeg i parken på fredag.
I met her in the park on Friday

[Motte henne i parken] gjorde jeg på fredag.
[Motte henne i parken på fredag] gjorde jeg (ikke).
* [Motte på fredag] gjorde jeg henne i parken.
* [Motte henne på fredag] gjorde jeg i parken.
* [Motte i parken] gjorde jeg henne på fredag.
* [Motte] gjorde jeg henne i parken på fredag.

(examples from Nilsen(1998, 63f))
The element in front of the finite auxiliary must be a single constituent. Nilsen shows, that the only possible structure for the full constituent "Motte henne i parken på fredag" can only be:

[[[Motte henne] i parken] på fredag]

Norwegian is a VO language for which Cinque proposes a pied piping analysis of verb movement around PPs. (e.g. in Cinque 2000 b). According to this proposal, modifying PPs are base generated in rigid order above the VP. In the following step, the arguments move out of the VP, leaving a remnant, in which the verb is the only overt material left. This remnant VP moves up cyclically and pied pipes the PPs with it, one after the other. The PPs end up in the reversed order:

\[
\begin{array}{c}
\text{PP}_1 \quad \text{PP}_2 \\
\text{VP} \\
[[\text{VP PP}_2 \ \text{PP}_1]]
\end{array}
\]

Since it is commonly assumed that temporals are higher than locatives, this would give us the right constituency for the element in first position of the Norwegian data.

For German, which is a OV language, Cinque proposes a different analysis. In dependent clauses the verb stays below the prepositional space, which therefore appear in direct order before the verb. In main clauses the verb moves up, but does not pied pipe the PPs, so they appear in direct order after the verb even in this case.

From this model we would expect certain restrictions for fronted V modifier complexes in German as well.

Unfortunately it is difficult to find good examples with two PPs fronted together with the verb. I tried several combinations, which all seemed to be very odd, without getting clear asymmetries in acceptance.

I want to present some of my data:

**Temporal – Benefactive**

Am Freitag für Bayern München gespielt hat er gerne.
On Friday for 'Bayer München' play+PART has he with pleasure.
'Playing for 'Bayer München' (soccer club) on Friday did he do with pleasure.'

? Für Bayern München am Freitag gespielt hat er gerne.

Both are possible, the second is slightly worse, but not ungrammatical as in the Norwegian case. If we move only one PP to the left, both sentences become equally acceptable:
Am Freitag gespielt hat er für Bayer München.
Für Bayern München gespielt hat er am Freitag.

Reason – Temporal

?? Am Freitag aus Angst gefehlt habe ich wirklich.
On Friday because of fear miss have I really.
‘Missing because of fear on Friday I really did.’

?? Aus Angst am Freitag gefehlt habe ich wirklich.

Both examples are odd. I cannot see any difference in acceptance. Fronting only one PP gives a sharp contrast:

Aus Angst gefehlt habe ich am Freitag.
* Am Freitag gefehlt habe ich aus Angst.

4.3.3 Binding theory

The three binding principles played an important role in the Government and Binding framework. In fact the framework itself got part of its name from them. It is very often assumed, that they could be used to detect movement. For convenience I quote them here in the formulation given in Haegeman (1994, 228f):

Principle A:
An anaphor must be bound in its governing category

Principle B:
A pronoun must be free in its governing category

Principle C:
An R-expression must be free everywhere

The important question is when these principles apply. For the Government and Binding framework we find in Haegman (1994,345):

..., we conclude, that Principles B and C apply to S-structure configurations. The evidence that Principle A can be fulfilled at D-structure is controversial.

The levels of S-structure and D-structure don't exist anymore in minimalists frameworks. In Cook and Newson (1998, 332) we find:

In the Minimalist Programme, the Binding Theory applies at LF.

In a more recent publication D. Sportiche defends the idea that Principle A can apply anywhere, whereas Principle C only at LF (Sportiche (2001)).
If an anaphor is bound by an element which is base generated in a C-commanding position we expect principle A to apply at this state. Any further movements of the anaphor across the binder should not have an effect on this. We find this in examples like:

[These pictures of each other], I think they liked t,

(Sportiche (2001,16))

They seems to be at some state of the derivation c-commanding each other. At this point Principle A applies and the following movement of the constituent [These pictures of each other] preserve the binding.

To illustrate the application to the analysis of PP ordering Cinque quotes an example of Pesetsky:

John spoke to Mary about [these people], in [each other's], houses on Tuesday
* John spoke to Mary in [each other's], houses about [these people], on Tuesday
* John spoke to Mary about [each other], in [these people's], houses on Tuesday.

The grammaticality of the first sentence is surprising for a theory which assumes DPs as being complements of prepositions. From this position, "these people" could never c-command and bind "each other".

If we assume the "anywhere"- analysis for Principle A, the grammaticality of this sentence tells us that at some stage of the derivation "these people" must c-command "each other". We could assume that this sentence presents both PPs in base generated position. Then we would expect that moving "each other" together with the preposition across the locative PP would preserve grammaticality. But this is not the case. Sentence two is ungrammatical, also sentence three.

That the base order of the two PPs is not important is shown by sentence three. The general rule seems to be that in English the PP to the right is bound by the PP to the left. Therefore, this test does not give us a hint for PP ordering. But since we expect the surface order of PPs in German to be in the reverse order (with respect to the English order), it would be interesting to look for Principle A effects in German as well. Unfortunately German is very impoverished with anaphors. There exists a reflexive "sich" and a reciprocal "einander", but their use is very restricted and in modifiers nearly excluded.

Principle C seems to be more of interest. But it seems very hard to find good sentences, which are easy to judge. I want to illustrate this with a few examples. Take the following sentences:

Ich habe in Karl's Haus an seinem Geburtstag gespielt.
I have in Karl's house at his birthday played
'I played in Karl's house at his birthday.'

Ich habe an seinem Geburtstag in Karl's Haus gespielt.

Here we can co index "Karl" with the pronoun in front. But this is not very surprising, since "sein" is too deep imbedded inside the DP to C-command "Karl". Take the example:

His wife saw John, in the mirror.

vs.

* He, saw John, in the mirror.
In the first sentence the pronoun does not C-command "John"; in the second it does. Therefore, pronoun and "John" cannot be co indexed in the second sentence. Therefore I tried to find examples where the DP "complement" of the first PP can be expressed by a pronoun. Furthermore the second PP should have a DP that could in principle be coindexed with this pronoun. If the first PP is temporal and the second locative it easy to see that these kind of examples are not easy to construct and even harder to judge. I tried with examples like:

Ich spielte in ihm. am Nationalfeiertag des Landes.
I played in it at the nation holiday of the country

This sentence is far too strange to be judged in a correct way. But as mentioned earlier sentences with the pronoun in Genitive position are easier to find, but I did not expect to find differences in co reference that depend on the order of PP types. But I was surprised to find the following asymmetries:

**Temporal – Locative**

Ich habe in Karls Haus an seinem Geburtstag gespielt.
I have in Karl's house at his birthday played
'I played in Karl's house at his birthday.'

Ich habe an seinem Geburtstag in Karls Haus gespielt.
I have at Karl's birthday in his house played
'I played at Karl's birthday in his house.'

* Ich habe ins seinem Haus an Karls Geburtstag gespielt.

**Instrument – Locative**

Ich habe mit Karls Säge in seinem Haus gearbeitet.
I have with Karl's saw in his house worked
'I worked with Karl's saw in his house.'

Ich habe an Karls Geburtstag mit seiner Säge gearbeitet.
I have at Karl's birthday with his saw worked
'I worked with Karl's saw oh his birthday.'

* Ich habe in seiner Säge an seiner Geburtstag gearbeitet.

**Instrument – Temporal**

Ich habe mit Karls Säge an seinem Geburtstag gearbeitet.
I have with Karl's saw on his birthday worked
'I worked with Karl's saw on his birthday.'

* Ich habe an seiner Geburtstag mit seiner Säge gearbeitet.
But the data are not coherent. If we take sentences where we can co index a pronoun in a PP with ad DP in a following PP to indicate that a movement has taken place, we can follow, that the PP to the left is basically lower. Then we get the results:

Locative > Temporal
Locative > Instrumental
Temporal > Instrumental

Which would result in the order Locative > Temporal > Instrumental which does not correspond to any other observation. Therefore I assume that the observed asymmetries are not due to base generated syntactic ordering of PP types. It would be interesting to collect more data and see whether it is possible to find a systematic pattern.

4.3.4 Quantifier Pronoun Binding

Larson used this test to show that an indirect object c-commands the direct object. In Larson(1988,336) we find:

A quantifier must c-command a pronoun at S-Structure if it is to bind it. Double objects show asymmetries regarding quantifier-pronoun binding possibilities:

I gave every worker, his, paycheck.
* I gave its, owner every paycheck.

But as in the case of Principle C violations it is very difficult to find examples that can easily be judged. I will give here some of my sentences:

Temporal – Locative

Ich habe in jedem Land an seinem Nationalfeiertag gearbeitet.
I have in each country on its national holiday worked
I worked in each country on its national holiday

and if every holiday had a proper country of origin:

? Ich habe an jedem Feiertag in seinem (hypothetischen) Ursprungsland gearbeitet.
I have on each holiday in its land of origin worked
I worked on each holiday in its land of origin.

The first is excellent, the second despite its constructed semantics syntactically non-marked.

Benefactive – Temporal

?? Ich habe an jedem Namenstag für seinen Heiligen gebetet.
I have on each Saint's day for its Saint prayed
'I prayed on each Saint's day for its Saint'.

Ich habe für jeden Heiligen an seinem Namenstag gebetet.
I have for each Saint on its Saint's day prayed
I prayed for each Saint on its Saint's day.
**Benefactive – Locative**

Ché Guevara hat in jedem Land für seine Unabhängigkeit gekämpft.

Ché Guevara has in each country for its independency fought

'Ché Guevara fought in each country for its independency.'

Er hat für jedes Land, in ihm, gekämpft.

He has for each country in it fought

He fought for each country in it.

These data shall suffice to show the difficulties in finding appropriate examples. The sentences seem so artificial that it is hard to tell whether the judgements are purely syntactic or due to the strangeness in meaning.

### 4.3.5 Semantic interpretation

Sentences in German with two PPs seem at first sight to have the same interpretation independent of the order between the PPs.

Ich habe am Dienstag in Venedig geschlafen.

I have on Tuesday in Venice slept

'I slept in Venice on Tuesday.'

Ich habe in Venedig am Dienstag geschlafen.

Both sentences describe the event of sleeping. This event took place in Venice and it happened on Tuesday. In an extensional semantics this could be described as the intersection of three sets, the set of events of sleeping, the set of events that took place in Venice and the sets of events that happened on Tuesday.

But we can interpret the sentences in a slight different way as narrowing down of events. The first sentences can be analysed as first taking the events of sleeping, then taking from this set the subset of events that took place in Venice and as a last step taking from this subset the subset of events that happened on Tuesday.

The second is ambiguous between taking first the subset of events in Venice or the subset of events on Tuesday.

Since we always end up with the same subset, this test is very subtle and cannot serve to give a proper ordering. But nevertheless it is important to observe that the two orders correspond to different orders of narrowing down, an observation which is shared by several German speakers.

### 4.3.6 Weak cross over

Again in Larson (1988) we find weak crossover effects as tool to detect movement. On page 336 he writes:

* A wh-phrase c-commanded at D-Structure by an NP containing a pronoun cannot be moved over that NP if wh- and the pronoun are coreferential. This is the so-called weak crossover effect. Double objects show weak crossover asymmetries:

  Which man, did you send his, paycheck?

  * Whose, pay did you send his mother?
Here again I found it very difficult to construct sound examples. It is no easy to refer in one PP to an element of another PP of a different type:

*  I welchem Haus, hat er für es, Geld gesammelt?
  ?  Für welches Haus, hat er in ihm, Geld gesammelt?

### 4.3.7 Wh - pronouns used as indefinites

Certain wh-words can in German be used as indefinite pronouns. They seem to be resistant against movement as Frey and Pittner (2000,7) state. Though it seems unclear why this is so, they give quite a good tool for base orders. Dependent clauses give the clearest results.

..., weil       wer                       wen                       beleidigt hat.
..., because somebody(NOM) somebody(AKK) offended has
  '..., because someone offended someone.'

?  ..., weil wen wer beleidigt hat.

which give the base order Subject > Direct Object

**Temporal - Locative**

..., weil Hans wieder wann wo gesoffen hat.
..., because Hans again at some time somewhere drunk has
  '..., because Hans has drunk again somewhere at some time.'

*  ..., weil Hans wieder wo wann gesoffen hat.

**Locative – Instrument**

..., weil Hans den Klaus wo mit was bedroht hat.
..., because Hans the (Akk) Klaus (some)where with (some)thing threatened has
  '..., because Hans threatend Klause with something somewhere.'

?? ..., weil Hans den Klaus mit was wo bedroht hat.

**Benefactive – Locative**

*  ..., weil Hans für wen wo gearbeitet hat.
  ..., because Hans for (some)one (some)where worked has
    '..., because Hans worked somewhere for someone'

  ..., weil Hans wo für wen gearbeitet hat.

**Benefactive – Instrument**
4.3.8 Licensing of negative polarity items

A negative polarity item should be c-commanded by a licensing element, e.g. negation or a wh element. Clear simple elements like "any" are not to be found. But larger constructions seem to have the properties in question. Translating from the Dutch "ook mar iets" and similar expressions we could try with “auch nur irgend- ” (any):

* Hans hat nicht nichts auch nur irgendetwem geschenkt.

So far this seem to work, but with modifiers the appearance of a negative PP and the "auch nur irgend- " element get the flavour of double negation, which is in standard German clearly out:

? Ich habe nirgendwo auch nur an einem Tag geraucht.
  'I never smoked in any room.'

4.3.9 Quantifier Scope (QS)

A quantifier can take scope over another quantified expression, if c-commanding this expression or its trace. Thus we can use this tool to detect movements. If a lower constituent with a certain quantifier has been moved over a higher element with another quantifier, we find scope ambiguities.

The moved element can take scope over the crossed element or the crossed element over the trace.

If we use quantified phrases in base positions we don't expect to find scope ambiguity:

 Ich habe mindestens einem Freund alle Fotos gezeigt.
  'I showed all photos to at least one friend.'

This sentence can only have the interpretation that there was at least one friend and to this friend I showed all the photos. But it can never have the interpretation that there was for each
photo at least one friend (and maybe a different one) to whom I showed the photos. The existential quantifier takes scope over the universal:

\[ \exists(x) \forall(y) \]

But if we move the direct object over the indirect we get an ambiguity:

Ich habe alle Fotos mindestens einem Freund gezeigt.

We can have the interpretation that there was at least one friend for each single photo and this could be always a different friend. In this case the universal quantifier takes scope over the existential quantifier:

\[ \forall(y) \exists(x) \]

But this time we get another interpretation. There is at least one friend to whom I showed all the photos, the existential quantifier takes scope over the universal.

\[ \exists(x) \forall(y) \]

Applying this test to modifying PPs gives good results for certain pairs:

Ich bin in jedem Jahr wegen mindestens einer Krankheit zum Arzt gegangen.
I am in every year because of at least one disease to the doctor gone.
I went to the doctor every year because of at least one disease.

Ich bin wegen mindestens einer Krankheit in jedem Jahr zum Arzt gegangen.
\[ \exists \text{ (reason)} \forall \text{ (time)} \]
\[ \forall \text{ (time)} \exists \text{ (reason)} \]

Ich bin in mindestens einem Jahr wegen jeder Krankheit zum Arzt gegangen.
\[ \exists \text{ (time)} \forall \text{ (reason)} \]
\[ * \forall \text{ (reason)} \exists \text{ (time)} \]

From these data we can conclude that Temporal PPs are generated higher than Reason PPs. In the first sentence the Reason PP has climbed over the Temporal PP giving rise to the observed scope ambiguity.

Unfortunately the contrast is not always so clear. In many cases we get both readings with both orders, though there is always a clear asymmetry. In each pair there is always one sentence for which the reverse reading (the interpretation with scope of the quantifier to the right over the quantifier to the left) is less available.

To be sure that the test itself was valid I compared every PP type with each other. I could not a priory assume transitivity. I needed to verify that the test gave a consistent result. If temporals turned out to be higher than locatives, locatives higher than instrumentals and instrumentals higher than temporals, I would not end up with a linear order.

I have used in all cases existential over universal and universal over existential quantifiers. To avoid indefinite readings I modified the existential with "mindestens" (at least). To avoid a collective reading for the universal quantifier I used "jeder" (each, every) instead of "alle" (all). Under the examples I give the accessible scopes, using "\( \exists \)" for the existential operator and "\( \forall \)" for the universal. In front I give the relative accessibility in question marks.

Ich habe an mindestens einem Tag für jeden Chef gearbeitet.
I have on at least one day for each boss worked.
I have worked for each boss on at least one day.

Ich habe an mindestens einem Tag für jeden Chef gearbeitet.
∃ (time) ∀ (beneficiary)
? ∀ (beneficiary) ∃ (time)

I have worked for each boss on at least one day.

Ich habe für mindestens einen Chef an jedem Tag gearbeitet.
∃ (beneficiary) ∀ (time)
∀ (time) ∃ (beneficiary)

I used the German perfect in all cases in order to have an auxiliary in second position. This gave me the possibility to posit a verum focus on it, to get clearer results in some cases. Putting stress on a finite lexical verb in second position focuses on the verb and not the reinforcement of the proposition ("Er hat geschlafen" meaning "indeed did he sleep" versus "Er schlief" meaning it was sleeping, what he did").

The most challenging task was the evaluation of the observed asymmetries in getting the reverse readings. I needed a firm quantification that allowed me to compare the different asymmetries to each other. I evaluated the scopal interpretations according to the following judgments: a "?" indicates that the interpretation is more difficult to get than the corresponding one of the other sentence of the pair. "??" indicate, that the interpretation is very difficult to get, but is possible, "#" means, the interpretation is not possible at all. Scope indications are in **bold**, when the reverse reading is the salient one.

Below the evaluated examples I list in brackets the evaluation as a 6-tuple in the form: (#?∃+, #?∀+, #?∃−, #?∀−, B∃, B∀) where

"#?" indicates the number of question marks "?", where the star "#" counts as three "?
"∃" and "∀" indicate the sentences with the existential operator ("∃") respective the universal ("∀") coming first.

The first couple, marked by the"+" sign give the evaluations if the results are in accordance with the resulting overall hierarchy.

In the beginning, I could not be sure that the evaluation of each sentence yields the same PP as the higher one. Theoretically it could be that three sentences gave one PP as the higher one, but the fourth sentence the other. In order to capture these cases as well, I added column three and four, marked by the "−" sign. But these cases are extremely rare; actually in the corpus discussed here there were only three cases.

"B" means "Bold Type" and tells whether the first reading one gets is the reverse reading. Here I distinguish also sentence with existential first ("B∃") from those with universal first ("B∀").
So we get for the relation between Benefactive and Reason:

\[
\begin{align*}
\text{Er hat für mindestens einen Heiligen wegen jeder Sünde eine Kerze aufgestellt.} & \quad \exists (\text{beneficiary}) \forall (\text{reason}) \\
\text{He has for at least one saint because of every sin a candle put up} & \quad \forall (\text{reason}) \exists (\text{beneficiary}) \\
\text{'He put up a candle because of every sin for at least one saint.'}
\end{align*}
\]

\[
\begin{align*}
\text{Er hat wegen mindestens einer Sünde für jeden Heiligen eine Kerze aufgestellt.} & \quad \forall (\text{reason}) \exists (\text{beneficiary}) \\
\text{Er hat wegen jeder Sünde für mindestens einen Heiligen eine Kerze aufgestellt.} & \quad \exists (\text{reason}) \forall (\text{beneficiary})
\end{align*}
\]

\[
\begin{align*}
\text{Er hat wegen jeder Sünde für mindestens einen Heiligen eine Kerze aufgestellt.} & \quad \forall (\text{reason}) \exists (\text{beneficiary}) \\
\text{Er hat für jeden Heiligen wegen mindestens einer Sünde eine Kerze aufgestellt.} & \quad \exists (\text{reason}) \forall (\text{beneficiary})
\end{align*}
\]

the grading: (1,2,0,1,0,0). The Benefactive wins weakly over Reason.

The numbers indicate:

**Sentences, whose evaluation is agreement with the overall result:**
The first two number give the number of question marks for interpretation of sentences where the lower element takes scope over the higher, when sitting to the right. In this case, the result of the tests give Benefactive as the higher element. Therefore, the two sentences which have the Benefactive to the left and the Reason to the right are evaluated here.

The first entry evaluates the sentence with the existential operator coming first (and the Benefactive to the left):

\[
\begin{align*}
\text{Er hat für mindestens einen Heiligen wegen jeder Sünde eine Kerze aufgestellt} & \quad \exists (\text{beneficiary}) \forall (\text{reason}) \\
\text{The interpretation where the lower element, Reason, takes scope over the higher, Benefactive,} & \quad \forall (\text{reason}) \exists (\text{beneficiary})
\end{align*}
\]

has one question mark, the resulting number is therefore 1.

The second entry evaluates the sentence with the universal quantifier coming first.

\[
\begin{align*}
\text{Er hat für jeden Heiligen wegen mindestens einer Sünde eine Kerze aufgestellt} & \quad \forall (\text{beneficiary}) \exists (\text{reason}) \\
\text{The interpretation where the lower element, Reason, takes scope over the higher, Benefactive,} & \quad \exists (\text{reason}) \forall (\text{beneficiary})
\end{align*}
\]

has two question marks, the resulting number is therefore 2.
**Sentences, whose interpretation point in the opposite direction:**
In most cases, positions three and four are 0. This sentence is one of the very rare examples which have three sentences giving one PP (Benefactive) higher than the other (Reason) and one sentence pointing in the opposite direction. Therefore, the position four is not 0. Evaluated are the two sentences where the lower PP sits to the left of the higher, that means the two sentences with the Reason PP to the left of the Benefactive PP. In this cases we expect the higher element still able to take scope over the left. Measured in this couple is the deviance of this behaviour, the degree to which this scope is judged odd or even ungrammatical.

The third entry evaluates the interpretation of the one of this couple with the existential coming first

\[ \text{Er hat wegen mindestens einer Sünde für jeden Heiligen eine Kerze aufgestellt} \]

The interpretation where the higher element takes scope over the lower

\[ \forall \text{(beneficiary)} \exists \text{(reason)} \]

has no question mark, the result is therefore 0.

The fourth entry evaluates the interpretation of the sentence with the lower element to the left, modified by the universal quantifier:

\[ \text{Er hat wegen jeder Sünde für mindestens einen Heiligen eine Kerze aufgestellt.} \]

This time we get one question mark for the relevant interpretation where the higher element takes scope over the lower

\[ ? \exists \text{(beneficiary)} \forall \text{(reason)} \]

Therefore the resulting number for entry four is 1.

**Sentences, who have salient interpretation where the element to the right takes scope of the element to the left.**
In cases where the two elements compared occupy distant positions in the resulting hierarchy the higher element tends to take scope over the lower element even when sitting to the right. If this interpretation is the salient one, the sentences are marked with **bold face**.

The fifth entry evaluates the sentence with the lower element (Reason) to the left, modified by the existential quantifier:

\[ \text{Er hat wegen mindestens einer Sünde für jeden Heiligen eine Kerze aufgestellt.} \]

Since the reverse reading, the one with the universal taking scope over the existential, is not salient the judgement evaluates to 0.

The sixth entry evaluates the sentence with the lower element (Reason) to the left, modified by the universal quantifier:

\[ \text{Er hat wegen jeder Sünde für mindestens einen Heiligen eine Kerze aufgestellt.} \]

Again, the reverse interpretation is not salient giving rise to the evaluation of 0.
When evaluating these sentences I tried not to read into the data what I expected. If you have a certain expectation it can never be excluded that this has some influence on the result. I tried as good as I could to evaluate the sentences without thinking about what I wanted it to be. I hope that I succeeded.

I want to point out that the two readings, if available, are connected with different intonation patterns. The following data shall exemplify this:

```
Ich habe an mindestens 'einem Tag für 'jeden Chef gearbeitet.
∃ (time) ∀ (beneficiary)
Ich habe an 'mindestens einem Tag für jeden Chef gearbeitet.
? ∀ (beneficiary) ∃ (time)

Ich habe für mindestens 'einen Chef an 'jedem Tag gearbeitet.
∃ (beneficiary) ∀ (time)
Ich habe für 'mindestens einen Chef an jedem Tag gearbeitet.
∀ (time)∃ (beneficiary)

Ich habe für 'jeden Chef an mindestens 'einem Tag gearbeitet.
∃ (time) ∀ (beneficiary)
Ich habe für jeden 'Chef an 'mindestens einem Tag gearbeitet.
∀ (beneficiary) ∃ (time)

Ich habe an 'jedem Tag für mindestens 'einen Chef gearbeitet.
∃ (time) ∀ (beneficiary)
Ich habe an jedem 'Tag für 'mindestens einen Chef gearbeitet.
∀ (beneficiary) ∃ (time)
```

Each PP can formally be described as P Q DP. To get the surface order scope, stress must be on the DP of the first PP and the Q of the second. To get the reverse scope reading, primary stress has to be on the Q of the first PP and secondary stress on DP of the second PP.

### 4.3.10 Focus neutral order

It seems that in most cases sentences with two PPs in the 'Mittelfeld', which differ only in the order of their PPs, have the same extensional interpretation. That means, they denote the same subset of events. Nevertheless there are differences in markedness and language speakers very often refute one order in certain circumstances. A first hypothesis could attribute these judgements to a difference in focus structure. The marked order can only be understood as the answer to a constituent question. In the non marked order the sentence could be the answer to the most general question, like “What did you / has the person in question do?, What happened?”

```
Was hast du (gestern) getan?
What did you do (yesterday)?

Ich habe mit einem Ball im Park gespielt.
'I played in the park with a ball.'

Ich habe im Park mit einem Ball gespielt.
'I played with a ball in the park.'
```
In the first case, both sentences can be understood as answers, though the second seems to be more marked.

Ich bin mit einem Vaporetto nach Venedig gefahren.
'I went to Venice with a vaporetto.'

? Ich bin nach Venedig mit einem Vaporetto gefahren.
'I went with a vaporetto to Venice.'

In this example, the second sentences is very marked. But this can be due to the fact that directional PPs are not pure modifiers of verbs of movement. Like resultatives they have a argument like status and tend to be close to the verb.

Vincent hat wegen des besonderen Lichts in der Provence gemalt.
'Vincent painted in Provence because of the special light.'

?? Vincent hat in der Provence wegen des besonderen Lichts gemalt.
'Vincent painted because of the special light in Provence.'

Here, the second sentence sounds very odd and cannot be answered to the question "What did Vincent do (last year)?". It is due to interpretative processes that the second sentence is not an appropriate answer. The first sentences can only interpreted with the meaning: "Vincent painted in Provence, and the reason why he did so was the special light (of Provence)." The second sentence with focus neutral intonation will be interpreted as "Vincent painted because of the special light and the place where he did so was Provence". This would give the special light as the reason of the painting itself, an interpretation which is counterintuitive. English speakers confirm the interpretation for the English translation. This is additional evidence, that in English PPs to the right take scope over PPs to the left.

In a classical extensional semantics both sentences should denote identical subsets of events. The denotation should in both cases be the intersection of the subset of events of John painting something, of events taking place in the French region of Provence and of events done because of special light.

But this interpretation does not account for the fact, that the place is meant to be under the scope of the reason.

The second sentence can only be used as an answer to either of the questions:

Wo hat Vincent wegen des besonderen Lichts gemalt?
'Where did Vincent paint because of the special light?'

and

Warum hat Vincent in der Provence gemalt?
'Why did Vincent paint in Provence?'

where the focused element in the answer gets prosodic stress:

Vincent hat in der Provence wegen des besonderen Lichts gemalt.

or

Vincent hat in der Provence wegen des besonderen Lichts gemalt.
The "" before a vowel indicates primary stress, *italics* the constituent in focus.
Modifier PPs seem to be inserted into the sentence in a rigid base order., the higher PP takes scope over the lower. This order can be reversed by subsequent movements for at least two reasons. Getting a marked focus structure is one motivation, reversing scope properties the other.
There is strong evidence, that locative modifiers are base generated higher than reason PPs.
We can see this for example with the QS test:

Vincent hat in mindestens einer Region aus jedem Grund gemalt.
Vincent has in at least one region because of every reason painted
'Vincent painted because of every reason in at least on region.'

Here we get at once the interpretation with the existential quantifier taking scope over the universal. The reverse scope, though still available, is very marked.

\[ \exists \text{(place)} \forall \text{(reason)} \]
\[ \forall \text{(reason)} \exists \text{(place)} \]

If we exchange the operators we get:

Vincent hat aus mindestens einem Grund in jeder Region gemalt.

Here we get both interpretations easily, the reverse scope interpretation is even preferred:

\[ \exists \text{(reason)} \forall \text{place)} \]
\[ \forall \text{place)} \exists \text{(reason)} \]

This gives us clearly the place PP as base generated above the reason PP. Nevertheless, in most descriptive grammars on German, reason modifiers appear to their left. This can be attributed to their scope characteristics. Reason modifiers tend to take a greater constituent into their scope.
In the example presented here, the first PP that is merged above the VP is the reason PP. If no further movements take place, we get the sentence:

"Vincent hat in der Provence wegen des besonderen Lichts gemalt."

Automatically "wegen des besonderen Lichts" has in its focus only the VP, which does not make much sense. Further movements have to take place to reverse the scope. If a certain focus structure is required, further movement might be necessary, maybe with the effect of arriving at the original order as in the case of

Vincent hat in der Prov'ence wegen des besonderen Lichts gemalt.

or

Vincent hat in der Provence wegen des besonderen L'ichts gemalt.

If we take another example where the most natural interpretation does not require the locative in the scope of the reason PP we get a result, that is more in tune with the base order:

Hans wurde in Bad Kreuznach wegen Rheuma behandelt.
Hans was in Bad Kreuznach because of rheumatisms cured
'Hans was cured because of Rheumatism in Bad Kreuznach.'

? Hans wurde wegen Rheuma in Bad Kreuznach behandelt.

In the first sentence, the locative PP ("in Bad Kreuznach") and the reason PP ("wegen Rheuma") can be interpreted as independent modifiers of the nuclear proposition "Hans wurde behandelt". The sentences

Hans wurde wegen Rheuma behandelt
Hans wurde in Bad Kreuznach behandelt.

are both grammatical.

However, the second sentence, "?Hans wurde wegen Rheuma in Bad Kreuznach behandelt" is slightly degraded. It becomes better, if we interpret "in Bad Kreuznach" as being under the scope of the Reason modifier (meaning he was cured anyway, but the reason why this took place in Bad Kreuznach was the special disease). With a special focus intonation the second sentence becomes also acceptable, without changing the scope relations.

This example shows, that the base order of modifiers does not always coincide with the "unmarked" order or the order that is found most in a statistical research over a corpus.

4.3.11 Informational Focus (IF)

Informational focus gives rise to an interesting asymmetry concerning word order. This observation was made by Lenerz(1977). A good description of the effect is found in Cardinaletti and Giusti (1996, 63f).

The informational structure of sentences can often be divided in a part conveying old information and a part conveying new information. The Topic represents the old, which repeats a part of speech that has been mentioned before. It is the part the sentence about which the speaker wants to tell us something. The focus represents this something, the new information. A classical – but not the only example is the answer to a constituent question. It normally repeats part of the question and adds as new information the questioned constituent.

If the question is

What did John buy?

a possible answer is

John bough a book.

where "John" is the topic and "a book" the focus.

Double object constructions in German reveal a peculiarity regarding the information structure. If the indirect object is questioned, the orders indirect object – direct object or direct object – indirect object are both possible in the answer. If the direct object is questioned, only the order indirect object – direct object is valid. This effect is often taken to show that "indirect object – direct object" represents the underlying base order.

Ich habe dem Kassierer das Geld gegeben.
I have (the cashier)+DAT the money given
I gave the money to the cashier.
Wem hast du das Geld gegeben?
To whom did you give the money?

Ich habe \textit{dem Kassierer} das Geld gegeben.
I have given the money to the cashier.

Was hast du dem Kassierer gegeben?
What did you give to the cashier?

Ich habe dem Kassierer \textit{das Geld} gegeben.

? Ich habe \textit{das Geld} dem Kassierer gegeben.

We can clearly detect the asymmetry and assign the base order to the sentence:

Ich habe dem Kassierer \textit{das Geld} gegeben.

This test turns out to be valid for adverbial PPs as well.

**Temporal – Locative**

Hans hat \textit{am Sonntag} in München geschlafen.
Hans has on Sunday in Munich slept.
Hans slept in Munich on Sunday.

Wo hat Hans am Sonntag geschlafen?
Hans hat am Sonntag \textit{in München} geschlafen.
?? Hans hat \textit{in München} am Sonntag geschlafen.

Wann hat Hans in München geschlafen?
Hans hat in München \textit{am Sonntag} geschlafen.
\textbf{Hans hat \textit{am Sonntag} in München geschlafen.}

The comparison shows, that in all cases the questioned modifier can be found to the right of the other. But to the left we find the questioned modifier only in one of the cases. If we generalize the idea of Lenerz, it is the higher modifier that we find to the left if focalised. As in the case of the QS Test there is rarely a clear case where only in one case both answers are equally available and in the other case one answer is good, the other totally ungrammatical. Again, I had to look at asymmetries.

For each combination of PP types I constructed two constituent questions, for each PP type one. I then evaluated the possibility of having the focussed element to the left.

One "?" indicates that both orders are available for both questions, but comparing the two answers with the focussed element to the right the one with the question mark is more marked. This is the weakest kind of asymmetry to be found.

Two question marks, "??" are given to a sentence if it is remotely possible, but very marked, as an appropriate answer.

The asterisk, "*", marks sentences that are clearly impossible as answers to the question.
Sometimes the sentence with the focussed element to the left is preferred to the other order, especially when this PP is much higher in the hierarchy with respect to the other. In this case, I give the sentence in **bold type**.

The result of the evaluation is a pair of numbers. The first number is the sum of "?", the asterisk counting as three. The second number is one, if the valid sentence with the focussed element to the left is in bold, otherwise it is zero.

4.3.12 Role Disambiguation

Some German prepositions are ambiguous with respect to the thematic role they are related to. The preposition "mit" could be related to many different roles: Instrumental, Comitative (these two share in many languages the same prepositions, e.g. in English "with", in Italian "con"), Means of Transportation and Manner:

**Instrumental:**

Ich öffnete die Tür **mit** meinem Schlüssel.
I opened the door **with** my key.

**Comitative:**

Ich ging **mit** Helga ins Kino.
I went **with** Helga into the cinema.

**Manner:**

Er öffnete den Safe **mit** großem Geschick.
He opened the safe **with** great skill.

Furthermore, we find the same preposition in some quasi-fixed expressions with the meaning of volitional modals

Mit Absicht ließ sie ihren gläsernen Schuh zurück.
With intention left she her glass(adj.) shoe back
'Intentionally she left her glass shoe.'

or epistemics

Mit großer Wahrscheinlichkeit wird der Prinz sie finden.
With great probability will the prince her find
Probably, the prince will find her.

and many others. Most of them can be distinguished by semantic features of the noun that they select. So Comitative selects in the usual case a noun with the feature [+hum], whereas Instrumentals normally are not compatible with it. But in the rare cases where the same noun can be object of two identical (homophonous) prepositions, we would expect an influence of the position of the PP to semantic disambiguation, if we are right in stipulating a fixed order for modifiers.

So let's assume for a moment that the Trojan horse had the name Archimedes. Then we can formulate the sentence:

**Odysseus eroberte Troja mit Archimedes.**
'Odysseus conquered Troja with Archimedes.'

Here, Archimedes is clearly instrumental. But if it is a name of a combatant it becomes commutative. Now if we put two together:

Odysseus eroberte Troja mit Achilles mit Archimedes.
Odysseus conquered Troja with Achilles with Archimedes

Odysseus conquered Troja with Archimedes with Achilles

The second becomes odd. If a German speaker would not know, which of the two, Achilles or Archimedes, is the instrument and which is the combatant he would clearly interpret always the first as combatant and the second as the instrument.

We can take this as an indication, that the Comitative is higher than the instrumental.

A good example is provided by Temporal and Locative “in”.

Think of a scientist of musical history, who worked the whole year on Vivaldi's "Four Seasons". Let's call him John. One of his friends tells another that John has discovered some clues inside one of the parts and he says:

Hans hat im Herbst im Frühling etwas Ungeheures entdeckt.
John has in the autumn in the spring something incredible discovered.

'John discovered something incredible in the spring in autumn.'

This could only mean that John had discovered something in the part entitled "Frühling" and he did so in the time of autumn. If we change the word order:

Hans hat im Frühling im Herbst etwas ungeheures entdeckt.

we get a different interpretation. "Frühling" becomes the temporal and "Herbst" the name of the music piece. If we take the name of the music piece to be an abstract locative description, we get:

Result (RD):

**Temporal > Locative**

If we are able to establish this to be a good test, we get a clear proof that word order between adjuncts is syntactically fixed.

**4.3.13 Pair – List Reading (PLR)**

B. Bruening, following R. May (1988), observed certain asymmetries in the interaction of Wh-operators and universal quantifiers (Bruening(2001)). Some questions, such as:

Which sheet did he drape over every armchair?
Which book did he give to every student?

allow two different answers. The first possibility is to answer with a single constituent.
It was the black sheet that he draped over every armchair. 
It was "The Minimalist Program" that he gave to every student.

But for both sentences we can possibly get a list of pairs as an answer. Each answer consists of an instance of the questioned constituent and an element over which the universal quantifier quantifies. In the case of the first question we can get:

He draped the black sheet over the large armchair, 
the white sheet over the small armchair and 
the green sheet over the old armchair.

He gave "The Minimalist Program" to Francesco, 
"The Antisymmetry of Syntax" to Soon and 
"Adverbs and Functional Heads" to Luigi.

The latter interpretations are called "pair – list readings". They are not available for the following sentences:

Which armchair did he drape every sheet over?  
Which wall did he spray with every color of paint?

The only possible answers are single constituent answers. (All examples from Bruening(2001, 236f)). The effect is considered by Bruening and May to be analogous to quantifier scope ambiguities. 

I tried to apply the test for detecting asymmetries between two different PP types. I expected to get pair list readings only in the case when the lower PP is fronted as Wh-word. In base position it would be under the scope of the universal quantifier of the higher PP, which would give rise to the pair-list reading.

I constructed sentences with a Wh-phrase, which questions a prepositional modifier. In the Mittelfeld is modifying PP containing a DP with a universal quantifier.

Wann hat Hermann in jeder Stadt gespielt? 
When has Hermann in every town played 
'When did Hermann play in every town?'

This question is ambiguous: the first reading questions the (unique) place where Hermann did play every day. The answer could be simply "Wimbledon" if Hermann played every day in Wimbledon. The second reading asks for a list of pairs, where each pair consists of a place and a day, e.g. "(Wimbledon, Monday), (New York, Tuesday), (Leimen, Wednesday)...". If the questioned PP had scope over the universal, before movement, we don't expect the pair-list reading (at least less available):

Wo hat Herrmann an jedem Tag gespielt? 
Where has Herrmann on every day played 
'Where did Hermann play each day?'

This time the salient interpretation is clearly the one of a question, that asks only for a single constituent. We do get a pair-list reading, but with a greater effort than in the first example.

4.3.14 Reference to events
I got the idea for this test after a discussion with J. Higginbothom about event structure. Neutral anaphors like "it" or "something" can refer to neutral objects as well as to events. They seem to be under-specified to a high degree. Take the following discourses:

Yesterday I saw a pig on the street. It was pink and had blue dots all over its body. The pig dropped little green apples with red stripes. It was disgusting. Van Gogh painted a pink pig with his thin paintbrush, something he has never done before.

In the first example "it" clearly refers to the DP "a pig", in the second, the most salient interpretation relates "it" to the event of "the pig dropping green apples with red stripes", but "it" could also simply refer to "the pig". In the last example the anaphoric "something" could either take up the event of painting a pink pig or the event of painting a pink pig with his thin paintbrush. So the last sentence is ambiguous and could mean either that Van Gogh had painted a lot of pink pigs before, but never with his thin paintbrush or that he had never painted any pink pig before.

This ambiguity is unexpected under a Davidsonian analysis of events variables, where the antecedent sentence would roughly have an interpretation in LF as:

$$\exists e \ [ \text{paint}(\text{Van Gogh, a pink pig, } e) \land \text{with(} \text{his thin paint brush, } e) ]$$

where there is only one event variable available to which the predicates apply. It seems more plausible, that we would have at least two event variables e and e', which enter LF in the more adequate form:

$$\exists e \exists e' \ [ e' = \text{with(} \text{his thin pain brush, } e) \land e = \text{paint}(\text{Van Gogh, a pink pig}) ]$$

Here events are identified as full-saturated predicates, i.e. predicates with all their arguments. The lowest event is the semantic verb together with the subject and all objects. The modifiers become under this view predicates with at least a lower event variable as argument. Once saturated, they themselves become events. The under-specified anaphor can refer either to e or to e'. In the first case it refers only to the act of painting a pink pig. But in the second case to the full act of painting a pink pig with a thin paint brush. Note, that you can substitute the argument e of the with-predicate by the full lower predicate, so an equivalent form would be:

$$\exists e \exists e' \ [ e' = \text{with(} \text{his thin pain brush, } e= \text{paint(} \text{Van Gogh, a pink pig}) ) ]$$

Thus e' includes the whole event, described by the sentence.

If we take German sentences with two PPs, we get ambiguities of the above type, but an additional surprising result:

Van Gogh hat in Arles mit Tusche ein Café gemalt,
Van Gogh has in Arles with Indian ink a coffeehouse painted,
etwas was er vorher noch nie gemacht hatte.
something, what he before until now never done had.
Van Gogh painted a coffeehouse with Indian ink in Arles, something he had never done before.

etwas = "to paint a coffeehouse" or "to paint a coffeehouse with Indian ink" or "to paint a coffeehouse with Indian ink in Arles"
Van Gogh hat mit Tusche in Arles ein Café gemalt, etwas was er vorher noch nie gemacht hatte.

As the example shows, the anaphor is 4 times ambiguous in the second example but only 3 times ambiguous in the first example. In the first example, where the PPs seem to be in the original, the basic order, the inner PP cannot be skipped in the interpretation of a possible antecedent for "etwas". The possibility of skipping "in Arles" in the second example could be an indication, that the first phrase is syntactically ambiguous, i.e. the phrase could be expressed by two different syntactic trees, which could give rise to different event interpretations:

Van Gogh hat [mit Tusche,] [[[in Arles[t_i] [ein Café gemalt]]], etwas was er vorher noch nie gemacht hatte.

Van Gogh hat [[[mit Tusche] [in Arles] [ein Café gemalt]]], etwas was er vorher noch nie gemacht hatte.

It is important to note that the referential ambiguity of the neutral anaphor is of semantic nature. This can be seen by clear monoclausal cases:

Dass Van Gogh in Arles mit Tusche ein Café gemalt hat, war etwas neues für ihn. That Van Gogh in Arles with Indian ink a coffeehouse painted has, was something new for him.

Here, the neutral anaphor "etwas" can only refer to the whole extended VP "to paint with Indian ink in Arles a coffeehouse". The other interpretations are no longer available. However, this behaviour could be explained if we can show that it is systematic and in some relation to the other asymmetries. If this turns out to be true, we have an additional test, which is by nature semantic, but seems to shed light on the syntactic structure.

I used in the examples for the second phrase of the sentences nearly always the expression "..., etwas was er vorher noch nie gemacht hatte" (..., something he had never done before). Unfortunately it doesn't combine with phrases containing a definite temporal PP (since it is trivial that you have never done a certain thing on Friday before that Friday). So I chose for the combinations with temporals the phrase "..., etwas was er sich vorher nicht zugetraut hätte. " (..., something he hadn't believed to be capable of).

4.4 Word Order in the German Mittelfeld

4.4.1 (Source: (Heidolph (1981,707ff))

We find the best descriptive overview over the German sentence structure in Heidolph (1981). Though sentence constituents in German can move more freely than in English, there are, according to Heidolph(1981), several distinguished positions which represent the unmarked surface order of these elements. With the help of the Infinitival Complex Test the authors manage to distinguish the following sections:
Advb_{III}
12a Temp Temporal modifier
12b Reason Reason modifier

Praedikatsgruppe

Advb_{II}
11 Loc Locative modifier
10 Instr instrumental adverbial /Man manner adverbial
9 ObjInd Indirect object
8 ObjDir Direct object, either a PP or NP in Accusative, Dative or Genitive

Engere Prädikatsgruppe

Advb_{I}
7 LocObj Locative modifier, related to accusative object
6 DirAbs Absolute determination of direction
6a DirAbsS Source
6b DirAbsM Means
6c DirAbsG Goal
5 DirRel Relative determination of direction

Predicate

4 Pred Predicative, thematic Expression, could be NP, AP or PP
3 Vz "Verbzusatz" (separable prefix)
2 V Main verb (semantic verb(s))
1 Aux Temporal and modal auxiliaries
0 fin Finite verb

Positions 13 and 12 can be found in the Vorfeld (only one).
The Mittelfeld is divided into "Prädikatsgruppe" and "Engere Prädikatsgruppe" where we find arguments and modifiers. The elements in the lower part, the "Engere Prädikatsgruppe" have argumental or quasi argumental status which have a very close connection with the verb. "Predicate" can roughly be identified with the right verb bracket. I don't want to discuss this order in detail. Of interest here is the thematic order of modifiers:

Temporal > Reason > Locative > Instrument > Source > Means > Goal

It should be mentioned, that this order is mainly descriptive. The Infinitival Complex Test, which the authors used did not distinguish between argumental and pure modifying PPs, nor did it try to avoid combinations of PPs where one tends to be in the scope of the other for semantic reasons (see the discussion above for the Focus Neutral Order test).

4.4.2 The data according to R. Hinterhölzl:
A more recent research is presented in Hinterhölzl(2000). Basic for detecting base order are intonation patterns:

*We assume that sentences with neutral intonation correspond to the unmarked or basic word order, from which sentences with marked word order (often accompanied with a special intonation pattern) are derived by additional movement.*

(Hinterhölzl(2000,296))

As I stated above in the section about Focus Neutral Order test, we cannot directly deduce from intonational neutral order the base orders. Unmarked, in the sense of more frequent or in the sense of neutral topic-focus structure, does not necessarily mean base generated. From the positioning of constituents in relation to negation and modal adverbs, Hinterhölzl arrives at the general conclusion:

- *Nominal complements of the verb always have to leave the VP before Spell-out (independently of whether they are definite or indefinite) and are licensed in functional projections above the position of manner adverbs.*
- *Also small clauses, idioms and directional PPs have to move out of the VP and are licensed in a position below manner adverbs.*

(Hinterhölzl(2000,304))

Apart of this, Hinterhölzl does not give us a rigid order between modifiers. He distinguishes VP adverbs (VP-Adv) and sentential adverbs (S-Adv). S-Adv appear to the left negation, VP-Adv to the right. The NPs that move out of the VP are divided into long-scrambled NPs (L-NPs), which appear to the left of sentential adverbs, and short-scrambled NPs (S-NPs), which sit between the negation and the VP-Adv.

We get:

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L-NPs   S-Adv   Neg   S-NPs   VP-Adv   V
```

4.4.3 **Frey und Pittner‘s „Zur Positionierung der Adverbiale im deutschen Mittelfeld“**

Another more recent research which regards modifier positions is presented in Frey and Pittner(2000). The authors use several tests to determine the base order of modifiers in the Mittelfeld:

1. Focus Neutral Order
2. Informational Focus
3. Principle C-violation
4. Question pronouns used as indefinites
5. VP-topicalisation
6. Quantifier Scope

Applying these tests to modifiers, they manage to establish five distinct groups:

1. Prozessbezogene Adverbiale
These are mainly manner modifiers. Their positions is behind the direct object. In their
base position they c-command the main predicate. Examples are:
schüchtern
'timidly'
auf bestimmte Art und Weise
'in a certain manner'
2. Ereignisbezogene Adverbiale (event related modifiers)
These are modifiers such as Instrumentals, Locatives and Comitatives. They are Ccommanded by the (surface position of the) subject and C-command the direct object.
Examples are:
mit dem Schraubenzieher
'with the screwdriver'
mit einem Freund
'with a friend'
'im Stadion'
in the stadion.

3. Ereignisinterne Adverbiale (event internal modifiers)
Here we find modifiers that characterise the attitude of the subject towards the action
or some of its inner states that accompany the action. We find them also between
subject and object. Examples are:
absichtlich
'intentionally'
gerne
'with pleasure'
4. "Satzadverbiale" (sentential modifiers)
These are Temporals, Epistemics and Evidentials. They c-command all principle
arguments of the verb.
wahrscheinlich
'probably'
angeblich
'allegedly'
erfreulicherweise
'happily


5. "Frame-" and "Bereichsadverbiale"

These are modifiers that give a frame in relation to which the rest of the proposition can be evaluated. They can be viewed as a topic. Their base position is in the middle field and they c-command the base position of every other constituent. Examples are:

- juristisch betrachtet
  'seen from a legal point of view'

- aus medizinischer Sicht
  'seen from a medical point of view'

Pittner and Frey claim that between these classes there are strict ordering relations, which are attributed to base generations. But between modifiers of the same class there are no syntactic motivated base orders. If we prefer one order or another, this would be attributed to semantic reasons. Thus we could have in one sentence two elements of the same class, but their order is (syntactically) free.

I want to present their reasoning with the example of Comitatives and Instrumentals.

- Er hat (zusammen) mit einem Freund mit einem Kleintransporter den Schrank herbeigeschafft.
  He has (together) with a friend with a truck the cupboard brought here
  'He brought the cupboard with a truck (together) with a friend.'

- ? Er hat mit einem Kleintransporter (zusammen) mit einem Freund den Schrank herbeigeschafft.
(Frey and Pittner(2000,22))

The authors confirm that there exists a tendency to prefer Comitatives in front of Instrumentals, but they believe this to be a only attributed to non-syntactic processes. They try to support this with several syntactic tests.

The QS Test produces:

- Er HAT mit mindestens einem Freund mit fast jedem Transporter Waren herbeigeschafft.
  He HAS with at least one friend with nearly every truck goods brought here
  'He brought goods with nearly every truck with at least one friend.'

- ? Er HAT mit mindestens einem Transporter mit fast jedem Freund Waren herbeigeschafft.
(Frey and Pittner(2000,22))

The authors claim that both sentences are non-ambiguous giving only scope of the existential over the universal operator. I get in the second sentence also the reverse interpretation with scope of the universal over the existential operator. This becomes more clear if we put the main stress on the first syllable of "mindestens".

A test with VP-topicalisation produces the sentences:
Mit dem Kleintransporter Waren herbeigeschafft hat er heute (zusammen) mit seinem Onkel.

? (Zusammen) mit seinem Onkel Waren herbeigeschafft hat er heute mit dem Kleintransporter.

(Frey and Pittner(2000,23))

Though the authors confirm the different acceptability, which posits the Instrumental closer to the verb, they attribute, however, to semantic preferences. Wh-pronouns used as indefinites give us:

weil er mit wem mit einem Lastwagen Waren herbeigeshafft hat.  
'because he with whom with a truck goods brought has'

weil er mit was mit einem Bekannten Waren transportiert hat  
'because he transported good with a friend with somewhat.'

(Frey and Pittner(2000,23))

I agree that these sentences do not exhibit much difference, but if we use both wh-pronouns in one sentence we get much clearer results:

weil er mit wem mit was Waren transportiert hat  
'because he transported goods with a friend with someone'

* weil er mit was mit wem Waren transportiert hat.

Though the first sentences is not very common, to me it sounds correct. The second, however, is totally out.

Their last test to support the hypothesis of belonging to the same class is the IF Test:

Mit wem hat er mit einem Kleintransporter den Schrank herbeigeschafft?  
'With whom did he bring the cupboard with a truck?'

Er hat (zusammen) mit einem FREUND mit einem Kleintransporter den Schrank herbeigeschafft.

Womit hat er zusammen mit einem Freund den Schrank herbeigeschafft?  
'With what did he bring the cupboard together with a friend?'

Er hat mit einem KLEINTRANSPORTER (zusammen) mit einem Freund den Schrank herbeigeschafft.

(Frey and Pittner(2000,23))

I admit, that the second order is possible, though the first seems more natural to me. I want to refer here to my own data which give a better contrast:
Mit wem ist Klaus mit dem Porsche gefahren?
Klaus ist mit Gisela mit dem Porsche gefahren.
Klaus ist mit dem Porsche mit Gisela gefahren.

Womit ist Klaus mit Gisela gefahren?
Klaus ist mit Gisela mit dem Porsche gefahren.
* Klaus ist mit dem Porsche mit Gisela gefahren.

(These example can be found in Appendix A under the combination "Means-Comitative" since I make distinction between Means of Transportation and Instrumental.)

The resulting order of Mittelfeld-modifiers for Pittner and Frey is:

- Frame und Bereichsadverbiale
- Satzadverbiale
- Ereignisbezogene Adverbiale
- Ereignisinterne Adverbiale
- Prozessbezogene Adverbiale

With this order they give a finer grading of Modifier with respect to former distinction between sentential modifiers and VP-modifiers as we find for instance in the work of Hinterhölzl.

4.5 My data

4.5.1 General methodology

I concentrated on three tests, namely the QS Test, the IF Test and the PLR Test. They proved to be easily applicable to German and to work with most combinations of PP types. With PP types I intend PPs which bear a certain thematic role.

In order to give valid results, each test has to result in a linear order. To define an order, the relation between two PPs A and B of different type has to be

1. antisymmetric: no PP type A can be higher than a PP type B and at the same time lower.
2. transitive: If PP type A is higher than PP type B and B is higher than PP type C, then A has to be higher than C.

In order to be linear, the order has also to be

3. total: For all distinct PP types A and B, there has to be relation which sets one of them higher.

Since the test give in some cases very subtle results I decided to apply all three tests on every possible combination. Thus we could get in the end an evaluation of the tests themselves.
I started with the presentation of Temporals. Then I added Benefactives and applied the tests to the combination of both. At the next level I added Reason PPs. I applied the tests to every possible combination among the three. In this way I added at each level another PP type – or thematic role. Of course the number of possible combinations increases at each level by one. Since I had 14 principal PP types we get $13 + 12 + 11 + \ldots + 3 + 2 + 1 = 91$ combinations. I tried to use examples with only pure modifying PPs and never use PPs where one is modifying the other or the DP of the other. Another obstacle regards "natural scope". As showed in the discussion of Focus Neutral Order, there are combinations of PPs, where one tends automatically to be interpreted in the scope of the other:

Vincent hat wegen des besonderen Lichts in der Provence gemalt.
Vincent has because of the special light in Provence painted
'Vincent painted in Provence because of the special light.'

Here "in der Provence" will be interpreted automatically under the scope of the Reason modifier. Certainly these dependencies influence the results of the tests in an unwanted manner. I therefore tried to accept only examples where both PPs can be understood as independent modifiers of the pure VP.

### 4.5.2 The main Thematic Roles

The fourteen PP types corresponding to thematic roles that I chose are not exhaustive. There are probably many others, some of which I will name below. The 14 types that I chose for the first research were compatible with all three tests. They are:

#### 4.5.2.1 Temporal

This expressions determine the time interval in which the actual event takes place. It could be a month, an hour, a year, a certain day etc. The preposition in German is either "an"/"am" (with day), "um" (with time) or "in" (with month, year, season):

- Am Sonntag (On) sunday
- Am gestrigen Tag Yesterday
- Um 14 Uhr At 2 pm
- Im Dezember In December
- Im Jahre 1492 In 1492
- Im Herbst In autumn

#### 4.5.2.2 Benefactive

The Benefactive introduces a participant who benefits from the action done by the actor. In German the preposition is always "für".

- Für seine Frau For his wife
- Für seinen Chef For his boss
Maybe this role must be distinguished from similar roles, often realised by the same proposition, which express someone who gives the order for the action or someone who has been substituted by the subject. I tried to stick to the above definition.

**4.5.2.3 Reason**

This role determines the reason, why a certain action was done. Typical prepositions are "wegen" and "aus":

- wegen einer Krankheit because of illness
- aus Angst because of fear

As I pointed out above, reason modifiers are more sensitive to scope effects than most of the other types. There is a big difference between "playing in the park because of the nice weather" and "playing because of the nice weather in the park".

**4.5.2.4 Locative**

This is maybe the most common, in any case the most described thematic role. It determines the place where the action takes place. This is usually done by relating this to an object, described by a DP. A great variety of prepositions make this relation explicit.

- in Venedig in Venice
- hinter der Schule behind the school
- vor der Schule in front of the school
- neben der Schule beside the school
- auf dem Tisch on the table
- unter dem Tisch under the table
- über dem Tisch above the table

Each of these preposition describe a different relation, a fact which gave rise to put propositions in the set of lexical elements (as opposed to functional elements). But several of those can be used also with other thematic roles:

- im (= in dem) Dezember in december (Temporal)
- über Mathematik about mathematics (Matter)
- auf mannigfache Weise in manifold ways (Manner)

This fact gave rise to the idea that all prepositions are originally locative and changed their meaning and usage, partly to become case assigners. (See for instance Anderson (1971). In some languages the same relation can be expressed by different prepositions. The "in-" relation in Italian is expressed by "in" together with country names, but by "a" with city names:

- a Venezia in Venice
- in Italia in Italy

**4.5.2.5 Instrumental**

This thematic role determines the instrument, the tool, which was used in order to commit the action. In German this role is exclusively realised by the preposition "mit".
mit einem Schraubenzieher  with a screwdriver

Since the same prepositions is used with Comitatives and Means, they are often confused with each other. I am not very sure whether Means an Instrumental take different positions. But Comitative and Instrumental have rather different semantics and sit in distinct positions.

4.5.2.6 Manner

This is maybe the most problematic group. Prepositional modifiers determine the manner in which a certain action was done. Frequently used prepositions introducing this theme role are "mit" and "auf". Speed modifiers are very often subsumed under this category. Since Cinque establishes frequentative and celerative adverbs as own classes in his hierarchy, I was careful which expressions to use. In order to be always in the same class, I constructed examples with PPs of the type.

auf besondere Art und Weise  in a special way

If taken in a broader sense, you would find examples such as:

mit Vorsicht    carefully
mit hoher Geschwindigkeit  with high speed

4.5.2.7 Comitative

Comitatives add a person, which share the role of the subject. If the subject is an agent, they are semantically also agents. But these additional agents are not introduced via coordination, but by means of a prepositional modifier. The accompanying preposition is in many languages the same as the one introducing instruments. In German this is "mit", in Russian "s", in English "with" and in Italian "con". I do not think, this is a sheer coincidence, but for the moment I have no explanation for it. The syntactic test show clearly that its position is much higher than the one of the instrument.

mit einem Kollegen  with a colleague

4.5.2.8 Evidential

This group of prepositional modifiers adds the source of the proposition. This can be a person, but legends, stories and rumours can also be stated. German has two adpositions, which introduce them, "nach" and "gemäß". Both can be used as prepositions or postpositions. "Nach" is more common with non human DPs. "Gemäß" as preposition can have either a genitive or a dative complement; as postposition it always follows a dative DP.

einem Zeugen gemäß  according to a witness
gemäß eines Zeugen  according to a witness
nach einer alten Legende  according to an old legend
einer alten Legende nach  according to an old legend

4.5.2.9 Matter
With these somehow artificial term I named a group of modifiers that give the topic of a talk, the subject of research or a book. In German it is used with the preposition "über"

über Mathematik  
about mathematics

4.5.2.10  Goal

This is a special kind of directional modifier which adds the goal of a movement. Since in many languages you can use nearly the same prepositions as with Locatives, Directionals and Locatives are often grouped together. In English you have to add the particle "-to" to some of the locative prepositions: "into", "onto", others like "under" are ambiguous. The preposition "to" by itself is only directional. In German, all locative prepositions can be used in directional goal modifiers. Additionally, there exists "nach"

nach Hamburg  
to Hamburg

4.5.2.11  Source

Source modifier specify the origin of a movement. They belong to the group of Directionals and are also related to locatives. In many languages, combinations of a preposition like "from" and locative preposition are used together to form something like "from under". Standard German does not allow for this construction, but several dialects have it ("von unter der Brücke"). Source modifiers are usually introduced by "von".

von München  
from Munich

4.5.2.12  Path

In addition to source and goal of a journey we can name a place, which has been passed by. In German, the preposition "über" introduces the place, sometimes you find "durch".

über Mainz  
through Mainz

durch Mainz  
through Mainz

4.5.2.13  Malefactive

This modifier adds an opponent, an obstacle to the proposition, a person or a weather condition which wants to block the action. Malefactives can also introduce a rival. Principal preposition in German is "gegen"

gegen das schlechte Wetter  
against the bad weather

gegen seinen Erzkonkurrenten  
against his arch-rival

4.5.2.14  Means

This term is meant as abbreviation for "Means of Transportation". Cars, public busses, bicycles, airplanes are all examples of instruments, which can be used for movement. It is not clear, whether this thematic role has to be distinguished from Instrumentals. But since verbs of movement have a particular behaviour, I decided to make this distinction. The results showed, that Instrumentals and Means PPs are close neighbours, if separate at all. In German as in many other languages, they share the same preposition "mit". In English, Means modifiers are often introduced by "by".
4.5.3 One example of the data

I want to give here the example of the combination of locative and temporal PPs.

Locative – Temporal

Quantifier Scope

Er hat an mindestens einem Tag in jedem Bett geschlafen.
He has on at least one day in each bed slept.
He slept in each bed on at least one day.

Er hat an mindestens einem Tag in jedem Bett geschlafen.
∃ (time) ∀ (place)
∀ (place) ∃ (time)

Er hat in mindestens einem Bett an jedem Tag geschlafen.
∃ (place) ∀ (time)
∀ (time) ∃ (place)

Er hat in jedem Bett an mindestens einem Tag geschlafen.
∀ (place) ∃ (time)
∃ (time) ∀ (place)

Er hat an jedem Tag in mindestens einem Bett geschlafen.
∀ (time) ∃ (place)

Er hat an mehr als einem Tag in fast jedem Bett geschlafen.
M (time) F (place)
?

Er hat in mehr als einem Bett an fast jedem Tag geschlafen.
M (place) F (time)
F (time) M (place)

Result (QS)

(0,2,0,0,0,0) Temporal > Locative

Pair-List Reading

→ In welchem Bett hat er an jedem Tag geschlafen?

An welchem Tag hat er in jedem Bett geschlafen?
Result (PLR)

Temporal > Locative

Informational Focus

Hans hat *am Sonntag* in München geschlafen.
Hans has on Sunday in Munich slept.
Hans slept in Munich on Sunday.

Wo hat Hans am Sonntag geschlafen?
Hans hat am Sonntag *in München* geschlafen.
?? Hans hat *in München* am Sonntag geschlafen.

Wann hat Hans in München geschlafen?
Hans hat in München *am Sonntag* geschlafen.
**Hans hat *am Sonntag* in München geschlafen.**

Result (IS)

(2,1) Temporal > Locative

First, we see the QS Test in the example. I started with the translation of the base phrase, which in most cases exemplifies the unmarked order. I present the German sentence, in a word to word gloss and a translation.

In the word to word gloss I grouped the elements of a PP together. In the translation I reversed the order of the PPs to account for our hypothesis that English reveals the reverse order of the German order. Thus, if the German unmarked order is Temporal > Locative we should have Locative > Temporal as the unmarked order in English. Of course, this is not a general rule since different topic-focus structures in the two languages could have additional effects.

After that I gave the first example with the existential operator coming first. Below the sentence I give the possible scope interpretations. In the case of the first sentence, both interpretations are possible: There is one single day and on this day he slept in every bed (∃(time) ∀(place)). The other interpretation is that he slept in every bed, not necessarily on the same day. But for every bed, there exist a day on which he slept in that specific bed.

After this sentence I kept the sequence of the operators and exchanged the thematic roles.

In the following two examples I exchanged the sequence of operators. In sentence 3 and 4, the universal operator comes first. This time we get a sharper contrast. While in the 3rd sentence both interpretations are equally available, the fourth reveals a strong asymmetry. The scope interpretation following the surface order is easy to get. But the reverse interpretation (there exists one concrete bed in which he slept on every day) is very hard to get. It is still possible to interpret the sentence with this scope relation, but with a greater effort.

In some examples, like this one, I added two other sentences with the operators "mehr als eine" (more than one) and "fast jedem" (almost every). In the evaluation below I abbreviated the operators as "M" and "F". These sentences in fact could sharpen the contrast but in the end they did not add any new information. Therefore, I didn't count them in the final statistics.

In the final row of the QS Test, I give the result. It is a 6-tuple of numbers, which in the above example have the following meaning:
0: no difference in the first pair, with the existential operator first
2: two question marks for the unmarked order in the second pair with the universal operator first
0: In the first pair, there is no result pointing in the wrong direction
0: In the second pair, there is no result pointing in the wrong direction
0: In the first pair, the reverse scope is never salient
0: In the second pair, the reverse scope is never salient

(I gave the exact definitions in the section about the QS Test).

Then follows the PLR Test. Since the sentences are derived from the first test, I did not give translations. The arrow indicates, which of the questions can be answered by a Pair-List. The result of this test is just an indication of the observed order, no grading.

The IF Test starts again with the translation of the base sentence. Next, I presented the first constituent question, containing a PP. The question is followed by two sentences. Each of the sentences has two PPs. One of them, PP1, has already been in the question. The other, PP2, can be understood as the questioned constituent. In these two sentences the order of the two PPs is exchanged. The questioned constituent represents the informational focus of the sentence and is given in italics. In front of the sentence we find either one question mark (?), two question marks (??), an asterisk, (*) or nothing, according to the availability of the sentence as possible answer to the question above. One question mark is given, if the sentence is available as an answer, but less available as the other answer to the same question and if, in addition, this contrast is sharper than the contrast between the answers of the other question. Two question marks are given if the sentence is rather odd as an answer to the question. The asterisk indicates that the sentence cannot be used as an answer.

In the example, we see "??" in front of the sentence "Hans hat in München am Sonntag geschlafen." This means, that this sentence could hardly count as answer to "Wo hat Hans am Sonntag geschlafen?", but still is possible in this context.

"Hans hat am Sonntag in München geschlafen." is given in bold letters. This indicates, that it is the preferred word order, though the focussed element is in front. This is a pattern, which I found only when this element is the higher one.

I conclude with the validation of the IF Test. It is a pair of numbers which in this case mean:

2: Two question marks for the asymmetric pair
1: One sentence in bold shows preference for the higher PP to stay in front

4.5.4 Results

The results we get from the tests are quite convincing. They reveal the validity of the three tests and give me the rigid linear order of PP classes, distinguished by thematic roles. I put the results into a database, that I wrote especially for this data, so they were easier to handle. I used SQL Base as database and SQL Windows by Centurra (SQL Builder, Version 1.0.0) as programming language. This gave me the possibility of doing statistical processing over the data.

The following table comprises the relevant data needed to compute the resulting hierarchy from the QS-Test. The entry "1" states, that the thematic role to the left is higher than the one below. "-1" is indicated, if it is lower. "NC" means that the two roles are not compatible with each other. The thematic roles are ordered by their position in the resulting hierarchy. The highest types are to the top and to the right. Deviations from the linear order are easily detectable: The higher left triangle should have only entries of "1".
The resulting hierarchy is:

Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Path/Means > Instrumental > Matter > Manner

The relation established by the test among the PP types is transitive without exceptions. The asymmetry between Path and Means was too weak to give any preference, so I could not establish any order between them.

The order is not total, since I could not apply the test for Means and Goal and for Means and Matter. These thematic roles seem to be incompatible with each other for independent reasons. Means modifiers only go together with motion verbs.

Goal PPs tend to have a very argumental status with motion verbs. Since in this part of the research I wanted to exclude strictly PPs which behave as being selected, I could not include the combination of Means and Goal.

Matter is very restricted in use and doesn't go together with motion verbs, probably for semantic reasons.

The cases where the results were ambiguous, where one of the observed pairs showed an asymmetry in the opposite direction, were extremely rare. In the narrow corpus of pure modifiers, I found this only once with the pair Path – Means.

For the PLR Test I got:

| Evidential | Temporal | Locative | Comitative | Benefactive | Reason | Source | Goal | Malefactive | Path/Means | Instrumental | Means | Path | Mat | Ins | Mea | Mal | Goa | Sou | Rea | Ben | Com | Loc | Tem | Evi |
|------------|----------|----------|------------|-------------|--------|--------|------|-------------|------------|-------------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1          | 1        | 1        | 1          | 1           | 1      | 1      | 1    | 1           | 1          | 1           |       | 1     |     |     |     |     |     |     | 1   |     |     |     |     |     |

The relation established by the test among the PP types is transitive without exceptions. The asymmetry between Path and Means was too weak to give any preference, so I could not establish any order between them.

The order is not total, since I could not apply the test for Means and Goal and for Means and Matter. These thematic roles seem to be incompatible with each other for independent reasons. Means modifiers only go together with motion verbs.

Goal PPs tend to have a very argumental status with motion verbs. Since in this part of the research I wanted to exclude strictly PPs which behave as being selected, I could not include the combination of Means and Goal.

Matter is very restricted in use and doesn't go together with motion verbs, probably for semantic reasons.

The cases where the results were ambiguous, where one of the observed pairs showed an asymmetry in the opposite direction, were extremely rare. In the narrow corpus of pure modifiers, I found this only once with the pair Path – Means.
This time, the test gives a relations that is not entirely transitive. Means, which is not listed above, appears higher than Malefactive, Manner and Path, at the same level as Instrumental and lower than the rest. It is not compatible with Matter as in the case of QS.
The only problematic relation is the one between Malefactive and Means. Without this one relation from 76, we get the order:

**Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Instrumental/Means > Path > Matter > Manner**

The result from the **IF-Test**:

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<td>Tem</td>
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<td>Evi</td>
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<td>1</td>
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<td>1</td>
<td>1</td>
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<td>1</td>
</tr>
</tbody>
</table>

This order is totally transitive. Differences between Means and Instrumental and between Path and Instrumental could not be detected, but Means appears above Path (with the grading (2,0)).
As always Means and Goal are not compatible, neither are Means and Matter. The resulting hierarchy is:

**Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Instrumental/Means > Path > Matter > Manner**

These results seem to be string evidence that each of the three tests is a valid instrument to give rise to a linear order of modifying PP types. Putting together the results of the three test we get:

<table>
<thead>
<tr>
<th>QS</th>
<th>PLR</th>
<th>IF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidential</td>
<td>Evidential</td>
<td>Evidential</td>
</tr>
<tr>
<td>Temporal</td>
<td>Temporal</td>
<td>Temporal</td>
</tr>
<tr>
<td>Locative</td>
<td>Locative</td>
<td>Locative</td>
</tr>
<tr>
<td>Comitative</td>
<td>Comitative</td>
<td>Comitative</td>
</tr>
<tr>
<td>Benefactive</td>
<td>Benefactive</td>
<td>Benefactive</td>
</tr>
<tr>
<td>Reason</td>
<td>Reason</td>
<td>Reason</td>
</tr>
<tr>
<td>Source</td>
<td>Source</td>
<td>Source</td>
</tr>
<tr>
<td>Goal</td>
<td>Goal</td>
<td>Goal</td>
</tr>
<tr>
<td>Malefactive</td>
<td>Malefactive</td>
<td>Malefactive</td>
</tr>
<tr>
<td>Path /Means</td>
<td>Instrumental / Means</td>
<td>Instrumental/MMeans</td>
</tr>
<tr>
<td>Instrumental</td>
<td>Path</td>
<td>Path/Instrumental</td>
</tr>
</tbody>
</table>
Comparing the three tests, we get a surprisingly consistent result. The whole region above the Malefactive and the lower region with Matter and Manner are identical for all three tests. The part in between, consisting of Path, Instrument and Means, is a bit blurry. No test was able to establish definite relations between each combination of the three. Whether Instrumentals and Means are really distinct PP types is indeed a matter of question, given the similar semantics, the difficulty in finding adequate examples, and the sameness of the preposition. Thus we get the overall linear order:

**Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Instrumental / Means / Path > Matter > Manner**

### 4.5.5 Relative Distances

The gradings of the QS Test and IF Test appear to give additional support. The very surprising result was that the judgements about the asymmetry between the two orders sharpened clearly with the distance of the two PPs in the hierarchy. In order to receive a measurable effect I had to quantify this judgement somehow. I assigned to each pair of PP types two numbers, which I calculated from the two result n-tuples of the QS Test and the IF Test.

The first number, $n_{QS}$, I calculated from the 6-tuple of the grading. Positive numbers of the 1st, 2nd, 5th and 6th place indicate high asymmetry. Thus I simply added them. Positions 3 and 4, in the rare cases they were different from 0, were subtracted, since they were pointing in the opposite directions. The formula is:

$$n_{QS} = QS_1 + QS_2 - QS_3 - QS_4 + QS_5 + QS_6$$

In the example from above, Temporal – Locative, this is $n_{QS} = 0 + 2 - 0 - 0 + 0 + 0 = 2$

The maximal entries for QS1 and QS2 are 3, which correspond to an asterisk. QS5 and QS6 can be maximal 1 each, if the reverse scope is salient. Thus the maximal value of $n_{QS}$ is

$$n_{Qs_{max}} = 3 + 3 + 1 + 1 = 8$$

The second number, $n_{IF}$, is the sum of the two number of the pair of the IF grading:

$$n_{IF} = IF_1 + IF_2$$

For the above example we get: $n_{IF} = 2 + 1 = 3$

The maximal entry for IF1 is 3, if I gave an asterisk to the incremented sentence. The maximal value for IF2 is 1, which corresponds to a sentence in bold. We get for the maximal value:

$$n_{If_{max}} = 3 + 1 = 4$$

For each PP type this gives me a range of 6 distance units above and below for the QS Tests and +/- 4 units for the IF Test.

Now I could give a list of distances for each PP type. Holding one type fixed, I could assign to each other type the $n_{QS}$ and the $n_{IF}$ to express the relative distance. Elements which are lower than this fixed point were assigned this number multiplied by (−1).
Therefore, I got two tables for each PP type, one for Qs and one for IF, which expresses the
distances of the others relative to this fixed point.
I will present these tables in Appendix F in the form of diagrams, where we find on the y-axis
the relative distance (positive or negative number) and on the x-axis the PP types. Since I did
not want to represent negative values, I added the number 5 to each value as ground level for
the IF-Test and the number 10 for the QS-Test.

4.5.5.1 Average

Since the judgement about the distance is not so firm as the pure higher-or-lower decision, the
results for each of the thematic roles cannot be taken absolutely. One has to consider also,
that, in the case of QS, there are only 8 distinct positions available above the point of
reference and below, given by \( n_{Qs_{\text{max}}} \). In the case of IF there are only 4 distinct positions
above and below.
For central positions like Source or Goal this is not much of a problem, but Evidential, as the
highest, has to fill 13 distinct thematic roles into these 8, resp. 4 slots. The same is valid for
Manner from the other side. Therefore, we get the best results for the central positions.
If each single diagram is taken by itself, the results are not quite exact. My next idea was, to
look whether I could sharpen is with the instrument of statistics. If for each position the
judgement of distances was a bit blurry, how would be the average of distances, integrating
over all judgements?
I chose Manner as an arbitrary point of reference \( TR_{\text{ref}} \). For every other thematic role \( TR_1 \) I
calculated their average distance to \( TR_{\text{ref}} \) in the following manner:

\[
n_{\text{Average}} = \frac{\sum_{nTR_2} (\text{Distance}(TR_2, TR_{\text{ref}}) - \text{Distance}(TR_2, TR_1))}{n_{\text{hits}}}
\]

This formula has to be interpreted in the following way:
For each thematic role \( TR_2 \), distinct from \( TR_1 \), I calculated the distance to \( TR_1 \) and the
distance to \( TR_{\text{ref}} \). Then I took the difference of the two. It is this difference that I added up for
all thematic roles \( TR_2 \).
But not all thematic roles were compatible with each other. I pointed out, that it is impossible
to have Means and Goal modifier PPs in the same sentence. For this reason, the number had
to be corrected. I divided the resulting number by the number of hits, i.e. the number of
thematic roles \( TR_2 \) compatible with \( TR_1 \).
To get a better contrast for the diagram, I multiplied the resulting numbers by ten.

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance from Manner</th>
<th>Average Distance from lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidential</td>
<td>101,67</td>
<td>15,83</td>
</tr>
<tr>
<td>Temporal</td>
<td>85,83</td>
<td>11,67</td>
</tr>
<tr>
<td>Locative</td>
<td>74,17</td>
<td>16,67</td>
</tr>
<tr>
<td>Comitative</td>
<td>57,50</td>
<td>6,67</td>
</tr>
<tr>
<td>Benefactive</td>
<td>50,83</td>
<td>5,00</td>
</tr>
<tr>
<td>Reason</td>
<td>45,83</td>
<td>6,25</td>
</tr>
<tr>
<td>Source</td>
<td>39,58</td>
<td>0,49</td>
</tr>
<tr>
<td>Goal</td>
<td>39,09</td>
<td>4,92</td>
</tr>
<tr>
<td>Malefactive</td>
<td>34,17</td>
<td>2,92</td>
</tr>
</tbody>
</table>
Below you can see the data represented in a graphical way.

<table>
<thead>
<tr>
<th>PP Type</th>
<th>Average Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path</td>
<td>31.25</td>
</tr>
<tr>
<td>Instrumental</td>
<td>27.50</td>
</tr>
<tr>
<td>Means</td>
<td>27.00</td>
</tr>
<tr>
<td>Matter</td>
<td>12.73</td>
</tr>
<tr>
<td>Manner</td>
<td>0.00</td>
</tr>
<tr>
<td>Goal</td>
<td>0.50</td>
</tr>
<tr>
<td>Source</td>
<td>14.27</td>
</tr>
<tr>
<td>Reason</td>
<td>12.73</td>
</tr>
<tr>
<td>Instrumental</td>
<td>0.00</td>
</tr>
<tr>
<td>Means</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Average Distance, QS-Test**

The first column presents the PP types ordered by their distance to Manner. As we see, they come in perfect accordance with the hierarchy resulting from the three tests. Path, Instrumental and Means are the three types, for which we did not get a consistent order from the single tests. Here we can see that the difference between Instrumental and Means is very small, compared to the others. To get an overview over the distances between neighbours, I added the third column.

A graphical representation of the distances between neighbours is given below.

**Distance between neighbours, QS-Test**

We can see, that besides Instrumental and Means, there is another couple, which is close together, namely Source and Goal. But in their case I would not think that they occupy the same slot, since they can be present in one and the same sentence without any problems. In fact, sentences like

\[
\text{Ich fuhr von Hamburg nach Köln} \\
\text{'I went from Hamburg to Cologne'}
\]

are very common.

Apart from the two couple with distance 0.5, we can distinguish three groups by neighbour distance:
If these distances are really correlated with distances between (extended)functional projections, we could infer that the group of distance 5 represents direct neighbours. The group of 5 indicates, that is one (extended) functional projection in between and the group of 15 a gap of two (extended) functional projections.

I made the same procedure for the IF-Test. This time I got

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance from Manner</th>
<th>Average Distance from lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal</td>
<td>51.67</td>
<td>1.67</td>
</tr>
<tr>
<td>Evidential</td>
<td>50.00</td>
<td>9.58</td>
</tr>
<tr>
<td>Locative</td>
<td>40.42</td>
<td>2.50</td>
</tr>
<tr>
<td>Comitative</td>
<td>37.92</td>
<td>6.25</td>
</tr>
<tr>
<td>Benefactive</td>
<td>31.67</td>
<td>4.17</td>
</tr>
<tr>
<td>Reason</td>
<td>27.50</td>
<td>2.92</td>
</tr>
<tr>
<td>Source</td>
<td>24.58</td>
<td>4.58</td>
</tr>
<tr>
<td>Goal</td>
<td>20.00</td>
<td>4.17</td>
</tr>
<tr>
<td>Malefactive</td>
<td>15.83</td>
<td>2.83</td>
</tr>
<tr>
<td>Means</td>
<td>13.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Instrumental</td>
<td>12.50</td>
<td>1.25</td>
</tr>
<tr>
<td>Path</td>
<td>11.25</td>
<td>8.52</td>
</tr>
<tr>
<td>Matter</td>
<td>2.73</td>
<td>2.73</td>
</tr>
<tr>
<td>Manner</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

In graphical representation the hierarchy obtained by the IF-Distances:

![Graphical Representation](image)

Average Distance, IF-Test

Compared with the above result, Temporals and Evidentials are reversed and instead of having the order Path > Instrumental > Means, we get the order Means > Instrumental > Path. The difference between Means and Instrumental is very low as in the above case. If we take Means and Instrumental as obtaining the same position the difference in the two hierarchies reduce to the order Evidential > Temporal, Path > Instrumental for QS and Temporal> Evidential, Instrumental > Path for IF.

The distance between Source and Goal is this time much bigger and cannot be neglected. Comparing the neighbour distances, obtained from both test, we cannot find any correlation. I will give both diagrams below.
Finally we can add the distances of both tests and obtain the following results:

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance from Manner</th>
<th>Average Distance from lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidential</td>
<td>151.67</td>
<td>14.17</td>
</tr>
<tr>
<td>Temporal</td>
<td>137.50</td>
<td>22.92</td>
</tr>
<tr>
<td>Locative</td>
<td>114.58</td>
<td>19.17</td>
</tr>
<tr>
<td>Comitative</td>
<td>95.42</td>
<td>12.92</td>
</tr>
<tr>
<td>Benefactive</td>
<td>82.50</td>
<td>9.17</td>
</tr>
<tr>
<td>Reason</td>
<td>73.33</td>
<td>9.17</td>
</tr>
<tr>
<td>Source</td>
<td>64.17</td>
<td>5.08</td>
</tr>
<tr>
<td>Goal</td>
<td>59.09</td>
<td>9.09</td>
</tr>
<tr>
<td>Malefactive</td>
<td>50.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Path</td>
<td>43.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Instrumental</td>
<td>41.00</td>
<td>4.75</td>
</tr>
<tr>
<td>Means</td>
<td>36.25</td>
<td>20.80</td>
</tr>
<tr>
<td>Matter</td>
<td>15.45</td>
<td>15.45</td>
</tr>
<tr>
<td>Manner</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Average Distance, both tests
Several PP types, concerned with aspectual and temporal behaviour, turned out not to be compatible with the QS-Test and the PLR-Test, since their DP could not be quantified. For some of them I tried to work with an asymmetric PLR-Test, i.e. I only used one sentence with a Wh-phrase questioning the new thematic role. If a list interpretation was available, I gave it a lower position than the universal quantified role, otherwise a higher one. Since this was not a contrastive test, judgments were more difficult and the results have to be handled with care. You will find them in the appendix, though I didn't use them for the general evaluation.

I applied the IF-Test to all of the new roles, getting some additional results and a finer graining of the hierarchy. First I want to introduce the different PP types:

### 4.5.6.1 Duration

The PPs of duration of time behave a bit differently from the others. They describe the duration of a process or a state. In German, there are three different types depending on their aspectual behaviour and their inner syntax: The prepositional "für"-PP and "in"-PP and the post-positional "lang"-PP.

The three types differ with respect to their aspectual behaviour. "Für" and "lang"-PPs go together with imperfective state of affairs; they describe the duration of a process which has not come to some natural end, while the "in"-PP describes the time for reaching a natural end point.

Krügers sind drei Stunden lang nach Paris geflogen.
Krüger(name, pl) are three hours long to Paris flown.
The Krüger family flew three hours in the direction of Paris.

Here it is not clear, whether the Krüger family ever reached Paris. It could have happened, that some UFO captured them or some other accident prevented them from reaching their presumed goal.

Krügers sind in drei Stunden nach Paris geflogen.
Krügers are in three hours to Paris flown.
The Krüger family flew in three hours to Paris.

This time, it is clearly stated, that the Krüger family reached Paris.
The "für"- PrepositionalP differs semantically from the "lang"- PostpositionalP in determining a planned duration (e.g. the time one plans to stay in another town). At the time of reference it describes an action in the future:

Krügers sind für drei Stunden nach Paris geflogen.
Krügers are for three hours to Paris flown.
The Krüger family flew to Paris and intended to stay there for three hours.

There is no specification of the duration of the flight itself, but a statement of the intended duration.
I called the three types Duration Temporal1 (prepositional “für”), Duration Temporal2 (prepositional “in”) und Duration Temporal3 (postpositional "lang").

4.5.6.2 Source Temporal

With this term I indicate a group of PP types that determine the beginning of a state of affairs. There are two prepositions: "seit" and "ab" which have a slightly different semantic. "Seit"-PPs are only compatible with a state of affair that is still going on at the time of reference, while "ab"-PPs select a state of affair either in the past or in the future:

Ich arbeite seit Mittwoch.
I work+Pres since Wednesday.
I am working since Wednesday.

* Ich arbeite ab Mittwoch.
I work+Pres since Wednesday.
I am working since Wednesday.

Er arbeitete ab Mittwoch.
He work+Past since Wednesday.

? Er arbeitete seit Mittwoch.

* Er arbeitete gestern seit 8 Uhr.
Er worked yesterday from 8 o’clock on.

Er arbeitete gestern ab 8 Uhr.

* Ich werde morgen seit 8 Uhr arbeiten.
I will work tomorrow from 8 o’clock on.

Ich werde morgen ab 8 Uhr arbeiten.

There is another difference between the two prepositions. "Seit" can be used with a temporal point that marks the beginning of a state of affair as well as with an expression of time length:

Ich arbeite seit Mittwoch.
I am working since Wednesday.

Ich arbeite seit drei Tagen.
I am working for three days now.
But "ab" is only possible with a time point:

Ich arbeitete gestern ab 3 Uhr.
I was working yesterday since 3 o'clock.

Ich arbeitete seit 3 Stunden, als...
I was working for three hours, when (something suddenly happened)

* Ich arbeitete ab 3 Stunden, als...

The distinction between time point and time interval is crucial in Spanish. It is expressed by the usage of different prepositions:
"Desde" indicates the point in time where a certain state of affair initiates.

Trabajo aquí desde el jueves pasado.
I am working since Thursday.
Ich arbeite seit Donnerstag.

"Hace" gives the amount of time which has passed between a certain punctual event and the point of reference.

Llegué a España hace tres años.
I arrived (here) three years ago.
Vor drei Jahren kam ich an.

"Desde hace" specifies the amount of time which has passed since the beginning of an event that is still in progress.

Trabajo aquí desde hace tres años.
I am working here for three years (now).
Seit drei Jahren arbeite ich hier.

The German "seit" can be translated either with "desde" or with "desde hace". In certain dialects it is possible to translate the last example with:

# Seit vor drei Jahren arbeite ich hier.

So it seems possible, that we will find three different positions. I called the three PP types: Source Temporal1 ("seit" + time interval), Source Temporal2 ("seit" + time point) and Source Temporal3 ("ab" + time point).

4.5.6.3 Past Temporal ("vor" + time interval)

The "Past Temporal" is a PP that consist of the preposition "vor" and a DP, indication a time interval. This interval specifies the time that has passed since the state of affair under discussion. As in the case of duration and source temporals the DP cannot be quantified with a universal quantifier, so the Quantifier Scope and Pair List Reading tests cannot be performed. The past Temporal responds to a question beginning with "Wann" (when).
4.5.6.4 Future Temporal ("in" + time interval)

The Future Temporal with "in" is the mirror of the Past Temporal with "vor". It describes an event that takes places after the specified time interval. The same restrictions as in the "vor"-case are valid. I tested the whole paradigm in order to see, whether we could distinguish different positions for future and past temporals, which could be identified with the two neighbouring positions T(past) and T(future) of the Cinque Hierarchy.

4.5.6.5 Results

The following table summarizes the results:

<table>
<thead>
<tr>
<th>Evidential</th>
<th>FutTemp</th>
<th>PastTemp</th>
<th>SouTemp1</th>
<th>Temporal</th>
<th>SouTemp3</th>
<th>Locative</th>
<th>SouTemp2</th>
<th>DurTemp3</th>
<th>Comitative</th>
<th>Benefactive</th>
<th>Reason</th>
<th>Source</th>
<th>DurTemp1</th>
<th>Goal</th>
<th>DurTemp2</th>
<th>Malefactive</th>
<th>Instrumental</th>
<th>Means</th>
<th>Matter</th>
<th>Manner</th>
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<td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td>
<td>-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Applying the IF-Test to the full sample of modifiers returns a nearly linear order. The only judgement destroying the otherwise consistent picture is the combination Goal – Duration Temporal2. If I ignore this judgment the resulting hierarchy is:

Evidential > Future Temporal/Past Temporal/Source Temporal1/Temporal > Source Temporal3 > Locative > Source Temporal2 > Duration Temporal2 > Comitative > Benefactive > Reason > Source > Duration Temporal2 > Duration Temporal1 > Goal > Malefactive > Instrumental/Means > Instrumental/Path > Matter > Manner

As before, there could be no difference detected between Means and Instrumental, nor between Path and Instrumental. Several combinations turned out to be incompatible for semantic reasons:

- Future Temporal – Past Temporal
- Future Temporal – Source Temporal1
- Future Temporal – Temporal
- Future Temporal – Source Temporal2
- Past Temporal – Source Temporal1
- Past Temporal – Temporal
- Past Temporal – Source Temporal2
- Source Temporal3 – Source Temporal1
Taken just these data, we could think of having only one temporal projection between Evidential and Locative, which hosts the types that I called Temporal, Source Temporal1, Source Temporal3, Future Temporal and Past Temporal.

The average distances can be computed as in the smaller sample giving the following results:

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance from Manner</th>
<th>Average Distance from lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal</td>
<td>53.53</td>
<td>2.53</td>
</tr>
<tr>
<td>Evidential</td>
<td>51.00</td>
<td>1.71</td>
</tr>
<tr>
<td>SouTemp1</td>
<td>49.29</td>
<td>3.66</td>
</tr>
<tr>
<td>PastTemp</td>
<td>45.63</td>
<td>1.25</td>
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<tr>
<td>FurTemp</td>
<td>44.38</td>
<td>3.79</td>
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<tr>
<td>SouTemp3</td>
<td>40.59</td>
<td>1.25</td>
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<tr>
<td>SouTemp2</td>
<td>39.33</td>
<td>0.58</td>
</tr>
<tr>
<td>Locative</td>
<td>38.75</td>
<td>3.50</td>
</tr>
<tr>
<td>Comitative</td>
<td>35.25</td>
<td>5.25</td>
</tr>
<tr>
<td>DurTemp3</td>
<td>30.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Benefactive</td>
<td>27.50</td>
<td>2.25</td>
</tr>
<tr>
<td>Source</td>
<td>25.25</td>
<td>1.75</td>
</tr>
<tr>
<td>Reason</td>
<td>23.50</td>
<td>4.06</td>
</tr>
<tr>
<td>Goal</td>
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<td>1.44</td>
</tr>
<tr>
<td>DurTemp1</td>
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<td>0.50</td>
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<tr>
<td>DurTemp2</td>
<td>17.50</td>
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<tr>
<td>Malefactive</td>
<td>14.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Instrumental</td>
<td>10.00</td>
<td>1.67</td>
</tr>
<tr>
<td>Means</td>
<td>8.33</td>
<td>0.58</td>
</tr>
<tr>
<td>Path</td>
<td>7.75</td>
<td>3.86</td>
</tr>
<tr>
<td>Matter</td>
<td>3.89</td>
<td>3.89</td>
</tr>
<tr>
<td>Manner</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The graphical representation:
The average distances suggest that the temporal space between Evidential and Locative comprises also Source Temporal2. This would situate all three Source Temporals, Future Temporal, Past Temporal and the ordinary Temporal in this area. A look at the relative distances between the positions helps to answer the question, whether these types can be found in the same projection:

Source Temporal3 and Source Temporal2 are close together. Given the fact that both describe the temporal distance between a punctual event and the reference time, there is reason to take their positions as being identical.

The same distance can be found between Past Temporal and Future Temporal. On the other side, their ordering, resulting from the average distance calculation, is the same that Cinque postulated for his hierarchy.

An even smaller distance is between Source Temporal2 and Locative, which are definitely different types.

This leads to the conclusion, that the neighbouring distances are not a good device for deciding the question, whether two types are in the same position. To get better insight, this data should be supported by additional tests.

We have now three points in this thematic hierarchy that we can identify with elements of the Cinque Hierarchy: Evidential, Temporal and Durative. In both hierarchies, Evidential is very high, followed in a small distance by Temporal. Duratives are much lower in both sequences. This indicates, that the two hierarchies actually present different positions of one and the same hierarchy. Adverbs are not sitting in a higher region, followed by a distinct hierarchy of PPs. It is more likely that there is a position for evidential, tense, frequentative aspect, egressive aspect, locative and all the other elements of the combined hierarchy. Each position can be
filled with a different kind of modifier such as extended PP, adverbial phrase, modal, auxiliary or simply a suffix. It remains to be seen, whether for each of these positions we have the same extended projection with several functional heads. In this case the difference in category will be realised by the properties of these heads.

4.5.7 Argumental PPs

Finally, I added PPs that were selected by the verb to the sample. Omitting them usually results in ungrammaticality. Additionally, all objects (or more general: all DPs and PPs selected by the verb) in German have in common that they cannot be found in the Nachfeld. The goal was to see, whether there were differences between PPs of the same semantic type depending on their status as pure modifier or argument. Since the three tests could be considered valid by the time I added these PP types, I applied them only to a subset of the possible combinations. I chose the following four types:

4.5.7.1 LPO – Locative Prepositional Objects

By locative prepositional phrases I mean phrases that are selected by the verb. In most cases they cannot be omitted without rendering the sentence ungrammatical. I chose the verb "liegen" (to lie) for my examples.

Hans liegt auf dem Bett.
'Hans lies on the bed.'

* Hans liegt.
* ..., dass gelegen ist auf dem Bett.

4.5.7.2 DPO – Directional Prepositional Object

These PPs are selected by verbs that describe the change of location of an object. They describe the final position of the object. The prototypical verb in German is "legen" (to lay, to put). These PPs are secondary objects, since the moved element is the direct object.

Hans legt das Buch auf den Tisch.
'Hans puts the book on the table.'

* Hans legt das Buch.
* ..., dass Hand das Buch gelegt hat auf den Tisch

4.5.7.3 DPO2 – Directional Prepositional Object

This is a control group of DPOs with the verb "schicken" (to send). The argumental status is less obvious, since the omission is possible. Nevertheless it behaves syntactically more like an argument than a modifier. Therefore, I take it to be identical to the DPO type.

Hans schickte einen Brief nach Hamburg.
'Hans sent a letter to Hamburg.'

? Hans schickte einen Brief.
... dass Hans einen Brief geschickt hat nach Hamburg.

### 4.5.7.4 RPO – Reason Prepositional Object

The German word "folgen", usually translated as "to follow", is manifold ambiguous. In one of its usages it requires a prepositional object, which indicates the conditions for the validity of the subject. Mathematical sentences make extensive use of the construction; it is widely used especially in logic.

Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit.
The theory of relativity follows out of the constancy of the speed of light
'The theory of relativity is the consequence of the constancy of the speed of light.'

* ... dass die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit.

It was not easy to determine the semantics of this PP type; closest came the identification with reason, but source resembles it as well. The tests could confirm this. Since "folgen" is not a motion verb, many thematic roles that require a motion verb are not compatible with the RPO. Duration Temporals don't go together with it either, because mathematical sentences are either valid for ever or not at all.

### 4.5.7.5 Results

I added the four PP types to the sample and applied the three tests to all possible combinations. The results are given below

For the QS Test:

<table>
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<tr>
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<td>-1</td>
<td>-1</td>
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<td>-1</td>
</tr>
</tbody>
</table>

For the PLR-Test

| Man | Mat | Ins | Mat | Path | Mal | DP2 | Goa | DPO | Sou | Rea | RPO | Ben | Com | LPO | Loc | Tem | Evi |
The difference between the two resulting hierarchies is only minimal. DPO, Goal and DPO2 are not compatible with each other and seem to sit in the same positions. This gives good reason to identify these types.

RPO appears as a neighbour to Reason. The QS-Test posits it above, the PLR-Test below. The sentences combining both are indeed quite odd:

Die Relativitätstheorie folgt wegen mindestens einem Prinzip aus jedem Axiom.

'The theory of relativity follows because of at least one principle from every axiom.'

Source is direct neighbour of RPO according to the PLR-Test and very close according to the QS-Test. It seems difficult to decide which of the both, Reason or Source, could be identical with RPO, maybe none of them.

LPO is according to the QS-Test between Locative and Comitative. The PLR-Test cannot distinguish between LPO and Comitative. Again, I opt for identification of LPO and Locative. The results from the IF-Test reveal a surprise:

Die Relativitätstheorie folgt wegen mindestens einem Prinzip aus jedem Axiom. The theory of relativity follows because of at least one principle from every axiom. The theory of relativity is a consequence of every axiom because of every principle.'
All prepositional objects appear below the lowest modifier position! This is the first time a fundamental difference between the IF-Test and the two scope tests appears. A possible explanation is to take the prepositional objects to be base generated in the VP shell from where they have to climb to the relevant functional projection in the modifier space. These projection license their thematic role. Pure modifier PPs are generated directly in the modifier space in the extended projection related to their thematic role. This analysis has consequences for the explanation of scope relations. If scope is established via simple C-command, we expect the scope relations to refer to base generated positions. Therefore, the QS-Test and the PRL-Test should give us the same results as the IF-Test, namely all selected PPs below Manner. The fact, that they appear in the functional projection related to the appropriate thematic role indicates that the prepositional objects have to climb up into a specific position to establish scope. Scope cannot be established simply by C-Command between base generated elements. I add the statistics related to the distances:

For the QS-Test:

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance from Manner</th>
<th>Average Distance from lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidential</td>
<td>99,38</td>
<td>13,75</td>
</tr>
<tr>
<td>Temporal</td>
<td>85,63</td>
<td>7,81</td>
</tr>
<tr>
<td>Locative</td>
<td>77,81</td>
<td>19,81</td>
</tr>
<tr>
<td>Comitative</td>
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<td>4,88</td>
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<tr>
<td>Benefactive</td>
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<td>0,27</td>
</tr>
<tr>
<td>LPO</td>
<td>52,86</td>
<td>8,17</td>
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<tr>
<td>Reason</td>
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<tr>
<td>RPO</td>
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<tr>
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<td>Manner</td>
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<td>0,00</td>
</tr>
</tbody>
</table>

Average Distances, QS-Test, small sample with prepositional objects

Though the two scope tests posit the prepositional objects in the position of their modifying equivalents they appear in the Average Distance calculation in all cases lower. This could indicate that they are moving from a position below Manner to their destination in the extended projection of the thematic role.
For the IF-Test

<table>
<thead>
<tr>
<th>Thematic Role</th>
<th>Average Distance to Manner</th>
<th>Average Distance to lower Neighbour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal</td>
<td>43,13</td>
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</tr>
<tr>
<td>Means</td>
<td>11,82</td>
<td>0,57</td>
</tr>
<tr>
<td>Instrumental</td>
<td>11,25</td>
<td>0,89</td>
</tr>
<tr>
<td>Path</td>
<td>10,36</td>
<td>5,81</td>
</tr>
<tr>
<td>DPO2</td>
<td>4,55</td>
<td>0,26</td>
</tr>
<tr>
<td>LPO</td>
<td>4,29</td>
<td>1,56</td>
</tr>
<tr>
<td>Matter</td>
<td>2,73</td>
<td>1,06</td>
</tr>
<tr>
<td>RPO</td>
<td>1,67</td>
<td>1,67</td>
</tr>
<tr>
<td>Manner</td>
<td>0,00</td>
<td>1,11</td>
</tr>
<tr>
<td>DPO</td>
<td>-1,11</td>
<td>0,00</td>
</tr>
</tbody>
</table>

Average Distances, IF-Test, small sample with prepositional objects

Here all prepositional objects appear in very low positions, but with view differences between each other. DPO2 and DPO, which I assumed to be identical, appear at both ends of the space spanned by the selected PPs. Therefore, the Average Distance calculation does not distinguish different base positions for the selected PPs. Probably they are all base generated in the direct or indirect object slot.

4.6 English

Two English speakers gave some judgements about word order and scope ambiguities in English. I asked the first speaker to give preferences for word order. I used only a subset of the small sample. I was interested in two aspects:
1. whether this simple test would lead to consistent results and a comparable hierarchy
2. whether the preferred word order is identical or reversed to the German one.

Question 2 could be mainly confirmed. Evidentials were accepted only in a position to the right of other PPs. Temporals were always preferred to the right of Manner, Comitatives, Instrumentals and Locatives. Exceptions were Matter and Reason (and of course Evidential). Therefore, I inserted a "1", if the preferred order had the higher PP to the right.

The resulting table is given below:
The upper left triangle has 23 entries of "1" and 10 entries of "-1"; 3 entries are "0". Reason is given higher than Temporal, Comitative and Locative. This effect is due to the tendency of Reason to take the other elements into its scope. If we take this into account, we get a result, that is not totally consistent, but nevertheless reveals a clear tendency of having higher elements to the right.

The second speaker judged some examples of the QS-Test. He evaluated combinations of Temporals, Instrumentals, Locatives and Reason.

The result is:

<table>
<thead>
<tr>
<th>Evidential</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Benefactive</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Reason</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Locative</td>
<td>0</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Instrumental</td>
<td>-1</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Matter</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>Comitative</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>Manner</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
</tr>
</tbody>
</table>

This result is relatively consistent. In all cases of un-ambiguity it was the element to the right, which took scope over the element to the left.

The two test together give strong evidence to confirm the hypothesis that, in unmarked English sentences, the PPs surface in inverted order with respect to the German order. Quantifier scope is evaluated in this case from right to left.

There are few exceptions with respect to the surface order. The evidential does not sound good behind the verb, it is much better at the beginning of the sentence. This might be due, to its very high position in the hierarchy, maybe even higher than the Agr position.

Source, Path and Goal come almost always in direct order, which could be attributed to semantic effects.

### 4.7 Reference to Events

This is the last test I applied to the sample. I used it with only few combinations. You will find the results in Appendix B. As long as I stayed with purely modifying PPs, the results are in perfect harmony with the other three tests.

Since for the larger sample QS and PLR were not available, I applied this test to one of the critical combinations, which indicated that indeed the Duration Temporal2 is above Goal. Duration Temporal1 and Duration Temporal2 are now between Source and Goal and sit maybe in the same extended projection.

Duration Temporal3, however, sits more likely above Locative and thus participates in the temporal section between Evidential and Locative.

With respect to argumental PPs, the "RE"-Test behaves differently. In most cases, the argumental PP can not be omitted in the referred event. I take this as a strong indication that they are an integral part of the lowest event possible, the verb with all its arguments.

Sometimes it is remotely possible to omit them, but only, if they are in front of the modifying PP. But even then, this interpretation is odd:
Er hat die Kartoffeln auf einen Teller mit einer Gabel gelegt, etwas, was er vorher noch nie gemacht hat.

etwas = "to place the potatoes on a plate with a fork" or "to place the potatoes on a plate"
? "to place the potatoes with a fork"

I get in this case the interpretation of an arbitrary argument, specified by a modifier. In the above case something like: "He placed the potatoes somewhere with a fork and this he did on a plate".

The data strongly suggest that we interpret sentences as a recursive description of events: First we evaluate the core proposition, consisting of the verb and its arguments. This whole proposition constitutes the core event, which becomes an argument for a higher modifier and so on.

### 4.8 Conclusion

Three syntactic tests were applied to combinations of PPs in the German Mittelfeld. QS, PLR and IF gave rise to the same linear order of PP types or thematic roles:

**Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Instrumental / Means /Path > Matter > Manner**

A larger sample of temporal expression gave a bigger distinction of the temporal sector and added a durative sector between Source and Malefactive.

Argumental PPs behave different with respect to the tests. The two scope tests, QS and PLR, posit them in the same position as their modifying partners. According to IF they are lower than the lowest modifier projection.

This could be interpreted that prepositional objects are base generated in the VP shell and rise to the appropriate extended projection later. Pure modifiers are base generated directly in this extended projection.

A close inspection of English gave rise to the hypothesis that this language has the same basic hierarchy, but the elements surface in the unmarked case in reverse order. Scope is evaluated in English usually from right to left.

The "RE"-Test and other data suggest that sentences are interpreted as recursive description of events.

Several things remain to be investigated. I started to test, whether subjects and ordinary objects can be included in the sample. The data are not clear yet. It remains to be seen, whether the scope tests assign them different positions according to their different case and/or their different thematic role (agent versus experiencer, theme versus goal, benefactive versus goal etc.).

Another line to be followed is to apply appropriate tests for other languages. It still remains to be seen to which degree the hierarchy is universal.
5 Syntactic Analysis of the Surface Word Order of PPs

5.1 The Basic Patterns

The PLR-Test introduced in Chapter 4 is applicable to PPs in German, English, Dutch and Italian and gives in all languages the same hierarchy. Nevertheless, we find different unmarked surface orders of the PPs in the different languages. They seem to be correlated with the OV versus VO parameter. A generalisation seems to be that we find strictly inverted order or direct order of PPs if they follow the verb, but only direct order in front of the verb. In the following I will use a numeration which assigns PP\textsubscript{1} to the highest element in the hierarchy, PP\textsubscript{n+1} corresponds to an element which follows PP\textsubscript{n} in the hierarchy. Thus the basic and direct order is represented by:

\[ \text{PP}_{1} \text{PP}_{2} \text{PP}_{3} ... \text{PP}_{\text{max}-1} \text{PP}_{\text{max}} \]

The inverted order, however, will have the representation:

\[ \text{PP}_{\text{max}} \text{PP}_{\text{max}-1} ... \text{PP}_{3} \text{PP}_{2} \text{PP}_{1} \]

5.1.1 The Direct Order

OV languages seem to show the direct order. PPs to the left take scope over PPs to the right in the unmarked case. German is an example of this pattern. In the Mittelfeld, unmarked PPs normally appear in the direct order. Reordering is due to scope or focus effects. In main clauses, where the verb climbs to a high position in the left periphery, we get the pattern:

\[ \text{V PP}_{1} \text{PP}_{2} ... \text{PP}_{\text{max}} \]

and in dependent clauses the pattern:

\[ \text{PP}_{1} \text{PP}_{2} ... \text{PP}_{\text{max}} \text{V} \]

In some cases, purely modifying PPs can be found after the right verb bracket. It is not easy to detect their unmarked order in this position, but they might be found in the inverted order, see below under mixed cases.

5.1.2 The Inverted Order

VO languages seem to reveal the inverted pattern. In the unmarked case, PPs to the right take scope over PPs to the left. We get the general pattern:

\[ \text{V (Obj) PP}_{\text{max}} \text{PP}_{\text{max}-1} ... \text{PP}_{3} \text{PP}_{2} \text{PP}_{1} \]
5.1.2.1 English

Appendix C shows data which confirm that the unmarked order is the inverted one. Appendix D indicates that the scope relation are from right to left in the unmarked case.

5.1.2.2 Norwegian

Nilsen shows that in Norwegian certain restrictions hold for combinations of a verb and two PPs that have been raised in front of an auxiliary:

\[
[Møtte henne] gjorde jeg i parken på fredag.
\]
\[
met her did I in park-the on Friday
\]
\[
'I met her in the park on Friday.'
\]

\[
[Møtte henne i parken] gjorde jeg på fredag.
[Møtte henne i parken på fredag] gjorde jeg (ikke).
\]

* [Møtte henne på fredag] gjorde jeg i parken.
* [Møtte i parken] gjorder jeg henne på fredag.
* [Møtte] gjorde jeg henne i parken på fredag.
* [Møtte på fredag] gjorde jeg henne i parken.

[Nilsen (1998,61f)]

Nilsen concludes from the data, that the basic constituency structure of the the selected IP before movement is:

\[
[[[Møtte henne i parken] på fredag]
\]

which is in agreement with the inverted pattern after the verb for VO languages.

5.1.3 Mixed Order

The above two patterns seem to divide the languages of the world into two groups which seem to correspond to VO and OV languages. But we also find some mixed cases in verb final languages, where the verb optionally can climb the lower PPs which appear in inverted order. The general pattern would be:

\[
PP_1 PP_2 ... PP_n V PP_{max} PP_{max-1} ... PP_{n+1}
\]

5.1.3.1 Dutch

J.Koster observed the so-called mirror effect: PPs that appear in a certain order in the Mittelfeld reveal the reverse order when extraposed to the Nachfeld (Koster (1974). The example is quoted in Barbiers (1995,103).

\[
Hij is \text{[PP_3 doorn stuurfout]} \text{[PP_2 met een knall]} \text{[PP_1 op het hek]} \text{[VP gestrand]}.
\]
\[
He is by a steering error with a bang on the fence stranded
\]
\[
'He is stranded on a fence with a bang by a steering error.'
\]
All other possible combinations (16) are listed with a star. We can draw the conclusion that PPs which are in front of the verb appear in direct order, elements that somehow show up in the Nachfeld have to be in inverted order. We get the following patterns:

a) \( PP_1 \ PP_2 \ PP_3 \ V \)
b) \( PP_1 \ PP_2 \ V \ PP_3 \)
c) \( PP_1 \ V \ PP_3 \ PP_2 \)
d) \( V \ PP_3 \ PP_2 \ PP_1 \)
e) \( PP_1 \ PP_3 \ V \ PP_2 \)
f) \( PP_3 \ V \ PP_2 \ PP_1 \)
g) \( PP_2 \ PP_3 \ V \ PP_1 \)
h) \( PP_2 \ V \ PP_3 \ PP_1 \)

Some comments on the ungrammaticality of the excluded combinations are in order. Barbiers verified the combinations by using unmarked intonation (personal communication). That means that some of the starred examples become grammatical if pronounced with a different intonation. This approach is different to mine. I evaluated all possible intonations and gave a star only when there was no possible intonation pattern.

Furthermore, it is not possible to generalise the example to all possible combinations of PPs. The PPs involved are not all pure modifiers. "Op het hek" has argumental character. One of the constraints for Dutch is, that this element has to be adjacent to the verb, either in front or behind. Only four sentences of the excluded combinations obey this constraint.

The last four examples, where the PPs in the Nachfeld have skipped others seem to be less acceptable than the other four, though an exact judgment is hard to give. After some discussions with Dutch speakers, it seems not totally clear whether

Hij is \( PP_3 \ \text{door'\textquoteright}n \ \text{stuurfout} \ [PP_1 \ \text{op het hek}] \ [VP \ \text{gestrand}] \ [PP_2 \ \text{met een knall}] \)

is much better than:

Hij is \( [PP_1 \ \text{op het hek}] \ [VP \ \text{gestrand}] \ [PP_3 \ \text{door'\textquoteright}n \ \text{stuurfout}] \ [PP_2 \ \text{met een knall}] \)

### 5.1.3.2 German

In German we also find modifying PPs in the Nachfeld, although it seems that they appear less frequently there than in Dutch. Argumental PPs are in contrast to Dutch totally excluded in the Nachfeld. Therefore, I cannot verify the German translations of the above data:

* Er ist gestrandet auf dem Zaun

I tried to compare scope properties of two PPs in the Nachfeld, but the data where not easy to interpret. The higher element tends to take scope over the lower to a higher degree than in the Mittelfeld. It could be that the scope taking of the lower element over the higher slightly
increases, if it is to the right. The data can be found in Appendix E. If anything, I can detect a slight mirror effect for German as well.

5.1.4 Patterns of Other Constituents

The same pattern is found with other constituents. The lexical head of a construction can be followed by modifiers in direct or inverted order, but only proceeded by them in their direct order.

5.1.4.1 DPs

Greenberg noticed this pattern for DP in his Univesal 20:

*When any or all of the items – demonstrative, numeral, and descriptive adjective – precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.*

Cinque exemplifies this with the inner structure of the semitic DP. In Standard Arabic we have:

```
s-suhuf-u l-jadiidat-u t-talaat-u haadhihi 
the-newspapers-nom the-new-nom the-three-nom these
'These three new newspapers'

* s-suhuf-u haadhihi t-talaat-u l-jadiidat-u 
   (*N Dem Num A)

  haadhihi s-suhuf-u l-jadiidat-u t-talaat-u 
  (Dem N A Num)

? haadhihi t-talaat-u s-suhuf-i/in l-jadiidat-u
  (Dem Num N A)
```

A more detailed inspection gives different classes of adjectives A

<table>
<thead>
<tr>
<th>Q Dem Num N A3 A2 A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q Dem N A3 A2 A1 Num</td>
</tr>
<tr>
<td>Q N A3 A2 A1 Num Dem</td>
</tr>
<tr>
<td>N A3 A2 A1 Num Dem Q</td>
</tr>
</tbody>
</table>

The examples are taken from Cinque (2000 b)

5.1.4.2 Verbal Complexes

According to Cinque(2000), certain restructuring verbs can be viewed as functional elements, basegenerated in functional projections above the VP and they behave like modifiers. Therefore, we expect a similar pattern of verb – auxiliary combinations.

5.1.4.2.1 Hungarian

Koopman and Szabolsci (2000) describe this exact pattern for Hungarian. Similar to German, we find verbs with separable prefixes in Hungarian. "be menni" (to go in, to enter). Some subject control verbs with infinitival complements build complexes with the main verb, amongst those "fog" (will), "akar" (want) and "kezd" (begin). "fog" can only be found in finite
form. Several sentences with the same interpretation (‘I will not begin to want to go in’) can be formed with different word orders:

Nem fogok kezde-ni akar-ni be men-ni
not will-1sg begin-inf want-inf in go-inf
'I will not begin to want to go in.'

Nem fogok kezde-ni be men-ni akar-ni
Nem fogok be men-ni akar-ni kezde-ni
Nem fogok kezde-ni be men-ni akar-ni

all other combinations are excluded:

* Nem fogok kezde-ni be akar-ni men-ni
* Nem fogok akar-ni be men-ni kezde-ni
* Nem fogok akar-ni kezde-ni be men-ni

If we abbreviate formally "fogok" with Aux$_1$, "kezdeni" with Aux$_2$, "akarni" with "Aux$_3$" and "be menni" with V we get the following patterns:

a) Aux$_1$ Aux$_2$ Aux$_3$ V
b) Aux$_1$ Aux$_3$ V Aux$_2$
c) Aux$_1$ V Aux$_3$ Aux$_2$
d) * Aux$_1$ Aux$_3$ V Aux$_2$
e) * Aux$_1$ Aux$_3$ Aux$_2$ V

Note, that pattern d) corresponds with the pattern e) of Babiers’ example of Dutch PPs in the Nachfeld. Pattern e) was evaluated grammatical. But see the general remarks with respect to grammaticality evaluations of the Dutch example. The Hungarian example points in the direction that skipping of an element in the post verbal, inverted order is less possible.

5.1.4.2.2 German

In German there are modals that could be easily assigned to functional projections of the Cinque hierarchy. In main clauses we find the finite modals in second position, the lexical verb sentence final.

Hans musste ein Haus bauen.
Hans must-Past a house build
'Hans had to build a house.' (Mod$_{necessity}$).

Hans konnte ein Haus bauen.
Hans could a house build
'Hans was able to build a house.' (Mod$_{ability}$)

Hans wollte ein Haus bauen.
Hans wanted a house build
'Hans wanted to build a house.' (Mod$_{volitional}$)

Hans durfte ein Haus bauen.
Hans was allowed a house build
'Hans was allowed to build a house.' (Mod$_{permission}$)
The next one is ambiguous:

Hans  sollte  ein Haus  bauen.
Hans  should  a house  build

between

'Hans ought to build a house.' (Mod_{obligation})

and

'Hans allegedly built a house.' (Mod_{evidential})

Things become interesting, when combining two modals. One modal is final, the other appears behind the verb in final position. Some combinations are possible, others not:

(1)  Hans musste ein Haus bauen können.
(2)  * Hans konnte ein Haus bauen müssen
(3)  Hans musste ein Haus bauen wollen
(4)  * Hans wollte ein Haus bauen müssen.
(5)  ? Hans musste ein Haus bauen dürfen.
(6)  * Hans durfte ein Haus bauen müssen.
(7)  * Hans konnte ein Haus bauen dürfen.
(8)  Hans durfte ein Haus bauen können.
(9)  Hans wollte ein Haus bauen können.
(10)  * Hans konnte ein Haus bauen wollen.
(11)  Hans wollte ein Haus bauen dürfen.
(12)  * Hans durfte ein Haus bauen wollen.
(13)  Hans sollte ein Haus bauen dürfen
(14)  * Hans durfte ein Haus bauen sollen.
(15)  Hans sollte ein Haus bauen müssen.
(16)  * Hans musste ein Haus bauen sollen
(17)  Hans sollte ein Haus bauen können
(18)  * Hans konnte ein Haus bauen sollen
(19)  Hans sollte ein Haus bauen wollen
(20)  * Hans wollte ein Haus bauen sollen.

The permitted examples with “sollen” are all more likely interpreted as evidential, in the combination with "müssen" obligatorily.

Though some of the starred examples as (6) seem to give no meaning; therefore they could be excluded for semantic reasons.Others like (4) are no more odd than their reversed counterpart (3). The data gives the following (syntactic) hierarchy:

sollen(evid) > müssen > wollen > dürfen > können

which perfectly corresponds to Cinque’s partial hierarchy:

Mood_{evidential} > … Mod_{necessity} > … Mod_{volitional} > … Mod_{ability/permission}

Furthermore, the data allows a distinction between the two functional projections subsumed by the last in the way:

Mod_{permission} > Mod_{ability}
Interesting are also the cases of combination of three modals.

- Hans musste ein Haus bauen können wollen.
- * Hans musste ein Haus bauen wollen können.
- * Hans wollte ein Haus bauen können müssen.
- * Hans wollte ein Haus bauen müssen können.
- * Hans konnte ein Haus bauen wollen müssen.
- * Hans konnte ein Haus bauen müssen wollen.

We see here the well-known fact that the verbs in sentence final position appear in the reverse order.
In final position we thus get verb auxiliary complexes of the form:

\[
\begin{align*}
V \\
V \ Mod \\
V \ Mod_2 \ Mod_1
\end{align*}
\]

5.1.5 Conclusion:

Modifiers of lexical items can be found in direct or inverted order behind the lexical item (verb, noun), but only in direct order in front. For verbs with 5 PPs we get the following patterns:

1. \( PP_1 \ PP_2 \ PP_3 \ PP_4 \ PP_5 \ V \) (German, dependent clauses)
2. \( V \ PP_5 \ PP_4 \ PP_3 \ PP_2 \ PP_1 \) (English etc.)
3. \( V \ PP_1 \ PP_2 \ PP_3 \ PP_4 \ PP_5 \) (German main clauses)

and the mixed cases:

4. \( PP_1 \ PP_2 \ PP_3 \ V \ PP_5 \ PP_4 \) (Dutch)
5. \( PP_1 \ PP_2 \ PP_3 \ V \ PP_4 \ PP_5 \) (to be expected)

5.2 A Symmetric Analysis

At first sight, a symmetric grammar seems to explain the data in very simple way. The hierarchy of thematic roles associated with the PP types underlies universally the structure of each sentence in each language. One thematic role selects another as its complement; the lowest selects the extended VP. Languages differ with respect to the order of complements or specifiers with respect to the head.

Since the base order of the PPs is never free, I do not consider the adjunct hypothesis here, which would not account syntactically for the data presented in Chapter 4.
If we take free order of specifier and complement with respect to the head we get the following possibilities:

A: spec left, comp right, asymmetric case  
B: spec left, comp left

\[
\begin{align*}
\text{A: spec left, comp right, asymmetric case} & & \text{B: spec left, comp left} \\
\begin{array}{c}
\text{XP} \\
\text{spec} \\
\text{X'} \\
\text{X} \\
\text{comp}
\end{array} & & \begin{array}{c}
\text{XP} \\
\text{spec} \\
\text{X'} \\
\text{comp} \\
\text{X}
\end{array}
\end{align*}
\]
Symmetric analyses of the English sentence structure take structure A as the principal pattern for CP, IP and VP:

For German, however, IP and VP are usually in symmetric models assumed to be head final (structure B), while CP shows structure A:

PPs are traditionally viewed as projections of the prepositional head, which selects the DP as its complement. Since I excluded adjunction, the only way for a PP of this kind to enter the picture is to sit in the specifier of a functional projection between CP and VP. Still above these PPs is a functional projection that hosts the subject. I will call it AgrP.

In English, the PPs follow the verb in reverse order. This comes out naturally without any movement if the functional projections hosting them are specifier final. Since the head is invisible, structures C and D are compatible with this model. For the whole sentence we get
with structure C:

```
  CP
   /\  \\
  C' /  \ AgrP
    /   \ \
   Subj /   \ Agr'
      /     \ 
     Agr /       \ FP_1
        /         \ F_1'
        PP_1
        F_1
        F_2
        F_2'
        PP_2
        F_2
        F_3
        F_3'
        PP_3
        F_3
        VP
         V'
         V
         Obj
```

with structure D:

```
  CP
   /\  \
  C' /  \ AgrP
    /   \ \
   Subj /   \ Agr'
      /     \ 
     Agr /       \ F_1P
        /         \ F_1'
        PP_1
        F_1
        F_2
        F_2'
        PP_2
        F_2
        F_3
        F_3'
        PP_3
        F_3
        VP
         V'
         V
         Obj
```

For the German case we expect a specifier initial projection, i.e. structure A or B. For the whole sentence we get with structure A:

```
  CP
   /\  \
  C' /  \ AgrP
    /   \ \
   dass /   \ Subj
      /     \ Agr'
     F_1P /       \ Agr
       /         \ F_1'
       PP_1
       F_1
       F_2
       F_2'
       PP_2
       F_2
       F_3
       F_3'
       PP_3
       F_3
       VP
        V'
        V
        Obj
```

```
  CP
   /\  \
  C' /  \ AgrP
    /   \ \
   dass /   \ Subj
      /     \ Agr'
     F_1P /       \ Agr
       /         \ F_1'
       PP_1
       F_1
       F_2
       F_2'
       PP_2
       F_2
       F_3
       F_3'
       PP_3
       F_3
       VP
        V'
        V
        Obj
```
The resulting structures for each of the lexical and functional projections in each language are:

<table>
<thead>
<tr>
<th>Projection</th>
<th>English</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Structure A</td>
<td>Structure B</td>
</tr>
<tr>
<td>F, P</td>
<td>Structure C or D</td>
<td>Structure A or B</td>
</tr>
<tr>
<td>AgrP</td>
<td>Structure A</td>
<td>Structure B</td>
</tr>
<tr>
<td>CP</td>
<td>Structure A</td>
<td>Structure A</td>
</tr>
<tr>
<td>PP</td>
<td>Structure A or C</td>
<td>Structure A or C</td>
</tr>
</tbody>
</table>

We see that neither of the two languages has consistently the same structure for all projections. Except for CP and maybe PP, the two languages differ with respect to the structure of each projection. If we take the structure difference for each projection to be correlated with independent parameters, we get at least 3 different independent parameters in a relevant section of the grammar. Since German and English are historically closely related, we do not expect a grammatical distinction like this.

Furthermore, we hope to find the principal distinction between VO and OV languages to be mirrored in these structures. If the structural parameter is indeed independent for each projection, we expect to find languages which have structure B for the VO and structure C for the FP, resulting in a OV language with inverted PPs, something which is not attested until now.

The only way out is to stipulate additional restrictions that exclude certain combinations. Haider's projective grammar, which introduces directions of licensing, is one way to do this. The end result is an antisymmetric world. It seems, that the language faculty is not symmetrical in the sense of permitting all possible combinations of word order.

### 5.3 The pied piping analysis

Cinque proposes a pied piping analysis for the PP surface orders (Cinque (2002, 11)), in which he uses strictly antisymmetric phrase structures. The PPs are merged in their basic order. The verb is base generated below and moves overtly or covertly up; a second parameter determines whether it pied pipes the passed PPs or not. The following shows the derivation of the five patterns with a pied piping analysis in a schematic way.

**Pattern 1** shows the base generated order. Nothing has moved, everything remains in its base position.

```plaintext
1. a V
   b PP
   c PP
   d PP
   e PP
   f PP
```

In **pattern 2** the verb moves cyclically over the PPs and takes the PP now sitting to its right with it on its next move:

```plaintext
2. a V
   b PP
   move VP
```
In pattern 3 the VP moves either in one step all the way up, or it moves cyclically around every PP without pied piping.

The two mixed cases exhibit the case that the verb neither stays in its base position, nor moves all away up across all PPs, but crosses some PPs and then stops before other PPs are still merged.

In pattern 4 the verb crosses PP₅ and pied pipes it along the next move across PP₄, but then stops and the rest of the PPs are merged to its left. It has the same derivation as pattern 2 till step f, but then only PPs are merged:
As in the case of pattern 3 we find two possible derivations for **pattern 5**:

a) the verb is moved in a single step to a position to the left of PP₄, then the rest is merged

```
a V
b PP₅ V
c PP₄ PP₅ V
d V PP₅ PP₅
e PP₃ V PP₄ PP₅
f PP₄ PP₃ V PP₄ PP₅
g PP₁ PP₂ PP₃ V PP₄ PP₅
h PP₁ PP₂ PP₃ V PP₄ PP₅
```

b) the verb moves around two PPs without pied piping them and then stops. We have the same derivation as with pattern 3 b) up to step f. Then the remaining PPs are simply merged.

```
a V
b PP₅ V
c V PP₅
```

Barbier's first four patterns are in fact examples of pattern 4 with different ending positions for the verb (and its pied piped constituents). His last four patterns are a bit more difficult to explain. One possible solution within the pied piping analysis would be to assume, that the VP not only pied pipes the sister node, but also some nodes above to a position higher. We would obtain the following derivations:

```
e) V
merge PP₃
merge PP₂
move VP and pied pipe PP₃
merge PP₁
PP₁ [PP₃ V] PP₂

f) V
merge PP₃
merge PP₂
move VP and pied pipe PP₃
merge PP₁
PP₁ [PP₃ V] PP₂
move VP and pied pipe PP₃ and PP₂
[[PP₃ V] PP₂] PP₁
```
If movement is always due to the attraction of (lexical) elements from higher functional elements, one could argue against the analysis of 6. e). The question arises, why the functional element between PP₂ and PP₃, which normally attracts the VP is skipped over. One way out, is to assume that the whole complex [PP₃ V] is moved into the spec of an (empty) functional head between the two prepositional expressions. A complete analysis with all functional heads would be:

e)  
merge PP₃  
merge f₁  
move VP and pied pipe PP₃  
merge PP₂  
move VP and pied pipe PP₃  
merge PP₁

This kind of analysis states, that in Dutch the verb can climb optionally across the PPs. However, this option is highly restricted to few types of PP combinations. In the case of pied piping, the VP can transport the PP to its right, but also PPs above. How many of these PPs are pied piped is also optional.

I want to give now a closer look on the distinct derivations of the pied piping analysis. At the beginning of the derivation we insert the VP with all its arguments:
In the highest spec position we find the subject, followed by the direct and the indirect Object, related all to light verbs in the sense of Larson (though differently from him in not allowing complements lower than the verb). With this structure we also obey the modified LCA of Koopman, which states, that no overt material in a specifier and a head are to be found together. If we want our theory to be so restrictive, that it prevents extraction out of specifiers, we cannot move the whole \( v_1 P \) up as one constituent and extract the individual arguments and the V later independently to different locations. The single parts have to move on their own from the beginning. That means that landing positions for each element have to be provided cyclically in each single step. For the moment, I will abstract away from the argument part and take only the lowest VP into consideration.

For each preposition, I propose an expanded projection that takes into account Kayne's proposal of having a Case Projection KP in the lowest position which is selected by a preposition P. This preposition could directly attract the VP to its specifier, but in order to be in agreement with the ideas of the morphological chapter, I add another projection, which provides a landing position for the VP, called LVP.

As next step the lowest prepositional expression is merged.
Pattern 1 results when the VP stays below and the other PPs are merged in direct order. In all other cases the verb moves to the spec of LVP.

The next prepositional material is merged:
Now the VP is attracted to the $\text{LV}_{\text{max}^-1}\text{P}$. In the pied piping case (patterns 2 and 4) it pied pipes the entire $\text{LV}_{\text{max}}\text{P}$ along with it:

Thus we get the inverted PP order (with the verb in front).

In the non pied piping case (patterns 2 and 5) the VP just jumps alone from [spec, $\text{LV}_n\text{P}$] to [spec, $\text{LV}_{n^-1}\text{P}$]:
The "upward" pied piping of the last 4 patterns of Barbiers' corpus remains to be accounted for. As an example I will show the derivation for pattern 6.f)

It starts like the other with the VP in base position.

Now the \( LV_{\text{max}}P \) attracts the VP, which pied pipes upward, i.e. what moves as a whole is the \( P_{\text{max}}P \):

The next KP – PP – LVP complex is merged:
The $LV_{\text{max}-1}P$ attracts the VP. Since we do not allow for extraction out of specifiers, the smallest constituent, which contains the VP that can move is the $P_{\text{max}}$. Whether the $LV_{\text{max}}P$ is pied piped (downward) along or not cannot be decided according to the data, since it is void of overt material. But we have shown above, that languages either always pied pipe downward or never. So we take the whole $LV_{\text{max}}P$ to be moved up:
The LV\textsubscript{max-2}P attracts the VP which is contained in the LV\textsubscript{max-1}P (remember, that it is a pied piping language, so at least downward pied piping is obligatory.)
and we get the surface order $PP_3 \ V \ PP_2 \ PP_1$.

The theory presented so far permits movements of maximal projections out of specifier and complement positions. They obey the usual restrictions such as the C-command condition and Cyclicity. Nothing is extracted out of a specifier.

What are the parameters in play? They span two dimensions of parametric variation:

First we have the common parameter which states how far the verb moves overtly. In English, it moves across all PPs before Spell Out. In German main clauses it also moves up across all PPs. In dependent clauses it stays in situ (presumably moving up after Spell Out). The Dutch data (maybe this is partly true for German as well) show, that the verb can optionally move across an arbitrary number of PPs.

If we abstract away from the Dutch data, this parameter can be identified with the common weak versus strong feature of the Minimalist Program. It is a characteristic of a functional head and thus compatible with Kayne's (2003) ideas.

The second dimension is spanned by the pied piping parameter. In a minimalist framework this means that the attracted feature (here base generated in V) is percolated to a node above its projection (the VP). In the example this is the LVP, which dominates the PP. Thus, the whole LVP is attracted, including the VP and the PP.

If we follow Kayne (2003), we want to exclude any syntactic parameter that permits pied piping in language A in general, but prohibits in language B prohibits (see also Chapter 2). We would like to correlate parameters with properties of certain functional heads. In this case the appropriate head would be LV, which forces the attracted feature of the verb to percolate to its maximal projection. This means that all LV in the different extended projections have to be identified. Otherwise we would have to deal with a statement like: In English all LVs trigger pied piping, in German none and there is no language in which some LVs trigger pied piping and others not.

In the Dutch case, where sometimes a PP above can be pied piped, this means that the pied piped P has the same property optionally. This means that we have to view P as a functional head.

Note, that this analysis adds an additional mechanism to the theory. A functional head can attract a maximal projection to its specifier, which results in the known process of Move. It also can attract the feature of a dominated head without any overt movement. This percolation permits its maximal projection to be attracted by another head, which attracts the percolated feature.

Ordinary attraction of an XP to a specifier usually implies the percolation of features from the head to its maximal projection. Features in most theories are not attributed to maximal projections only to heads. The only way to avoid percolation at all is to take basic projections to be in the lexicon instead of heads as proposed in Chapter 2.

There is another problem with the Dutch example. There are two ways for the verb to raise up: in main clauses via movement from specifier to specifier without pied piping and in dependent clauses via pied piping. The first movement is obligatory, the second optional. What determines whether the verb raises with or without pied piping?

Optional pied piping raises a problem for the theory. J. Koster and S. Barbiers pointed out to me (p.c.) that the semantic/pragmatic interpretation of the different word orders is not identical. It is totally unclear, how these interpretations can be linked to a feature of a functional head, which gives rise to optionality.

A last observation is in order. The pied piping analysis is by no means compatible with the morphological analysis of chapter 2. It is crucial for the latter that there is no intervening material between morphemes. In the pied piping approach, the verb moves together with a complex of PPs (and the object) from modifier projection to modifier projection. Certain affixes are certainly higher than certain PPs. Thus a complex phrase with the verb followed by
PPs would land in the specifier of suffixes. In the morphological approach of Chapter 2, the whole complex, including V, PPs and suffix would have to be interpreted as a single word. Another problem arises with verb second languages:

### 5.4 The Verb Second Problem

We saw that in German main clauses the verb raises above all modifiers into the left periphery. In dependent clauses, this movement is blocked by the overt complementiser. In head movement theories it is assumed, that the landing position of the head V is C, which in case of dependent clauses is already occupied. The head movement constraint demands that it has to pass every intervening head, i.e. at least I.

Even theories in which the maximal projection VP is moved have to deal with intermediate landing positions in which morphological features are checked or affixes are assigned. In German we have at least to assume tense and agreement inflection. Tense projections are definitely higher than locative adjuncts. What happens exactly when the complementizer occupies the C-position? Why does the verb not move to the penultimate position and the complementizer blocks only the successive movement to C?

main clauses:

```
Topic/Focus Verb … Adj … Agr … Adj … Tense … Adj … tVerb
```

dependent clauses:

```
Topic/Focus … Adj … Agr … Adj … Tense … Adj … Verb
```

* Topic/Focus … Adj … Verb- Agr … Adj … Tense … Adj … tVerb

How does the verb at the beginning of the derivation know, that at some very late stage the whole movement up to C will be blocked and so doesn't even move to Tense and Agr? A possible answer is to assume, that Agr and Tense have weak features that can be satisfied after Spell Out, whereas C has a strong feature, which can be satisfied either by C or the verb, but this must happen overtly. If there is no complementiser, the verb has to move before spellout to C. The head movement constraint guarantees that the verb passes on its way up the intermediate positions.

If the verb waits until the only functional head with strong features, C, is merged before moving up, the movement to the intermediate stops is not done cyclically. Movement to the intermediate heads has to be done at the moment they are created. In early minimalist frameworks this contradiction is solved by introducing the competition of derivations. Every possible movement, which obeys locality and economy principles is done, but only the convergent derivations survive. In this model there is no local motivation for a single movement. The principle of interpretation is the only justification for the dislocation of elements.

This implies that V moves locally to an intermediate head with weak features at a certain stage, where no head with weak feature has been merged. Modern minimalist analyses tempt to avoid this mechanism of "look ahead". Every moment has to be motivated locally. Therefore, these approaches have a problem with verb movement to intermediate positions.
But it is easy to see, that this cannot be done in a local cyclic way. The verb must look ahead a long way that definitely passes at least two phases. Kayne showed in recent works, that many linguistic phenomena, such as operator variable binding, which originally were the reason to invent covert movement to LF, are explainable totally by means of overt movement. If we follow these lines it could be interesting to see, whether we could explain verb movement without any covert post Spell Out component. In the case of German dependent clauses this means that the verb always moves to the intermediates stops. This movement will be hidden by additional movement of the other material across the verb.

5.5 Overt Verb movement driven only by morphology

There are several ways to achieve this. One would be to first move the verb all the way up to the next morpheme and then move the rest that is left behind in front of it. A projection, which in any case provides morphology for the verb to check or to get assigned to, is TP. Let us take a sentence like

..., dass Hans wahrscheinlich im Garten mit der Schaufel arbeitete.  
..., that John probably in the garden with the shovel worked  
'..., that John probably worked with the shovel in the garden.'

The epistemic "wahrscheinlich" is higher than the TP, the Locative "im Garten" and the Instrumental "mit der Schaufel" according to the assumed hierarchy. If we abstract away from the subject we get the following derivation:

<table>
<thead>
<tr>
<th>basic verb position</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>first PP (instrumental) merged</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>PP₂ V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>second PP (locative) merged</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>PP₁ PP₂ V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TP merged</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>TP PP₁ PP₂ V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>the verb moves to check its (past) morphology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>TPV PP₁ PP₂</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>the two PPS have to move now, for the derivation to be cyclic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>PP₁ PP₂ TPV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>the epistemic is merged.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>g</td>
<td>EpP PP₁ PP₂ TPV</td>
</tr>
</tbody>
</table>

Now, the verb is in sentence final position, the basic order, though several movements have occurred. If no complementiser is merged next, the tensed verb will move up and some other topicalised material will follow in first position. In case of a complementiser these additional movements are blocked. If the verb moves via head movement, we can retain the analysis, that both, verb and complementiser, compete for the same position. If the verb moves via XP movement, this analysis is not available. It seems, that German dependent clauses with overt complementisers do not have the full left peripherical structure as main clauses have. Especially topics seem to be excluded. Compare:
Was hat Hans am Freitag gemacht?
'What did Hans do on Friday?'

Am Freitag hat Hans Fußball gespielt.
'On Friday Hans played soccer.'

Ich glaube, dass Hans am Freitag Fußball gespielt hat.
'I think that John played Soccer on Friday.'

* Ich glaube, dass am Freitag Hans Fußball gespielt hat.

While in the main clause answer, "am Freitag" is in the typical topic position in front of the verb, this position is not available in dependent clauses. "Am Freitag" has to appear after the complementiser and, as the example shows, after the subject. If these type of clauses do not have topic positions, then no movement into first position is possible. The left periphery of dependent clauses is reduced in German and probably the prototypical landing position for verbs in main clauses is also missing.

Now we have a possible derivation for the German case, where the verb (VP) movement is driven purely by morphological reason. The verb moves in one step from the merge position to the affix positions, skipping all intervening PPs and other adjuncts (and thus revealing an asymmetry between affixes and other modifiers). If we compare this derivation with the pied piping analysis seen for English, it seems not very obvious how to find a parameter accounting for the different behaviour of the two (types of) languages. In English, the verb stops in every intervening PP area and pied pipes its overt material on its way up. So there are at least two parameters at work: the pied piping parameter and the “don’t skip intervening PPs”- parameter. The latter at least seems to be dispensable. We could assume, that in German the verbs stops also in the PP area in a specifier position and moves from there cyclically up to the affix position. The difference with English would reduce to the pied piping parameter.

As we saw above, pied piping is not compatible with the morphological approach of Chapter 3. Therefore, in both languages verb and modifier move independently around the higher (over) modifiers. The difference between the two languages has to be found in the way they move. I will call this the cyclic approach, where each "cycle" is linked to the merge of a modifier.

5.6 Cyclic approaches

The general idea behind this approach is to relate to each prepositional modifier an extended projection which consist at least of the overt material of the PP itself, i. e. the preposition P and the DP. Whether the DP has moved into this position from below or is directly merged there, is not important for this analysis. I will abbreviate this complex with PP$_p$.

The cyclic approach hinges crucially on the idea that the verb, moving as part of an XP, makes an intermediate stop in each of these extended projections. Therefore, the extended projection of a PP has to provide at least one landing position for the VP. In the general case I will assume that the relative position of the verb to the PP complex will be preserved at each intermediate step. Before entering the PP area different processes may be involved. The same is valid for movements that follow this part of the derivation (for instance movements of the verb into the left periphery).
In the English case, the PPs, though base generated in direct order, end up in reversed order. The most economic way to achieve this is to reverse their order cyclically. Since we want to exclude movement to a position below, the extended projection of an English PP also has to provide landing positions for the lower (already inverted) PP complex. For the German case I argued for additional movements of PPs across the moved V, which “hide” this verb raising. This means that we have to assume landing positions for PPs in German as well. In both cases these landing positions can be above or below the overt material of the actual PP. I will exclude the possibility that anything can land between the P and its DP-“complement”. If this were the case, than we would probably find languages that show this separation on their surface order. The lower PP complex will be called in the following PP_{n-1}, its landing position L_prepP.

I will now give a complete list of the possible derivations, depending on the landing positions of the lower PP complex and the verb relative to each other and the actual PP. Borders between extended projections are indicated with dashed lines.

*Derivations that result in direct order:*

**A.1 LprepP below**

If we abstract away from the verb for the moment we get

```
<table>
<thead>
<tr>
<th></th>
<th>Prep_n\textsuperscript{P}</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prep_{n-1}\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td></td>
</tr>
</tbody>
</table>
```

Each additional movement would be redundant. Adding V movement, where the position of the verb either in front of the whole complex or behind is preserved, we get the two possibilities:

**A.1.1 LprepP below, verb final:**

```
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Prep_n\textsuperscript{P}</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prep_{n-1}\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Prep_n\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>
```

**A.1.2 LprepP below, verb initial:**

```
<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>Prep_{n-1}\textsuperscript{P}</th>
<th>Prep_n\textsuperscript{P}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prep_n\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Prep_n\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Prep_{n-1}\textsuperscript{P}</td>
<td>Prep_n\textsuperscript{P}</td>
<td></td>
</tr>
</tbody>
</table>
```

**A.2 LprepP above**

If the landing position is above, we need an additional move of the higher adjunct to the left of the moved element to arrive at superficial direct order:
For the preserved verb final position we get two derivations, one with the landing position of the verb below the base position of $\text{Prep}_{n-1}P$ and one (immediately) above:

A.2.1 a) $L\text{Prep}P$ above, verb final, $LVP$ low

$$
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
$$

A.2.1 b) $L\text{Prep}P$ above, verb final, $LVP$ higher

$$
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
$$

A.2.2 $L\text{Prep}P$ above, verb initial

$$
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
$$

B Derivations that result in inverted order:

B.1 $L\text{Prep}P$ below

$$
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
\quad
\begin{array}{c}
\text{Prep}_n P \\
\text{Prep}_{n-1} P \text{ Prep}_n P
\end{array}
$$

This is a derivation with two moves of $\text{Prep}_n P$! The first seems to be entirely redundant. Furthermore, it is improbable that the extended projection of a PP has two landing positions of the same element. I will exclude this derivation therefore from the list.
I started this discussion with the idea, that the verb even in German dependent clauses moves cyclically around the modifier space resulting in a direct order of PPs, verb final. In the case of empty complementiser, the verb does one additional step and moves in front. Thus, we can deduce the verb initial, direct order case from the verb final, direct order case. The verb final, inverted order case is never observed in nature. Though, in principle, one could think that the verb initial order could be derived from the inverted, verb final case in the same way the German verb second position is derived, this does not seem very plausible. We would expect to find in nature traces of the inverted, verb final case. Therefore, I will exclude the inverted verb final derivation from the list.

Most modern syntactic theories assume structural universality. Kayne's proposal that parameters are only properties of functional elements is an example of this tendency. Following this line we can exclude that the German type languages have the landing position of the PP complex below the overt material whereas we find this position above in the English type languages. Nevertheless we can think of a very extended projection connected with each modifier, which has several possible landing positions for the lower modifier complex and the verb. To cover all possible cases we get in principle the following positions:

LPrep  LVP  LPrep  LVP  PP  LPrep  LVP

Different languages could activate different landing positions for the lower PPs and the verb. For each of the remaining schemes we can assume a possible derivation. Following Kayne's proposal that prepositions sit in heads directly attached to the main projections line, further exclusions have to be made. Since attraction of the actual prepositional material would have to be necessarily a movement out of a complement position, all lower material would be transported with. This renders the schemes A.2.1 a) and A.2.2 impossible. If we accept this analysis only four schemes remain: A.1.1, A.1.2, A.2.1 b) and B.2.2.
The only possible derivation of the inverted order is represented by scheme B.2.2. Both landing position of the verb and the lower PP complex, are above the actual prepositional material. I will take this as a guideline and assume that there is only one fixed position for the LVP in relation to the overt PP material. This position is above. For the verb final direct order case remains only scheme A.2.1 b).

Though do not want to exclude the other schemes in principle, I take B.2.2 to be the one which gives me the correct derivation for the English case with postverbal PPs in inverted order and A.2.1.b) the scheme for the German dependent clause structure, with PPs in direct order in front of the verb. The main clause structure with verb second in German is derived from this scheme by an additional movement of the verb.

Both schemes are cyclically and contain only movements from a complement position, which goes together with the derivations described in Chapter 3. Therefore, the two types of derivation can show the direction of a highly restricted theory of movement.

In the following I want to show a schematic sketch of the derivations of the two pure types (PPs in inverted order after the verb, PPs in direct order in front of it). I will abstract away from arguments and other overt material. After a small discussion of the necessary extensions I will give full derivations of real sentences.

5.6.1 Derivation of the inverted structure

For the pattern with the inverted PPs there was only one scheme left, B.2.2, which I will repeat here for convenience:

\[
\begin{array}{c}
  \text{Prep}_{n-1}P \\
  \text{Prep}_nP \\
  V \\
\end{array} \quad \begin{array}{c}
  V \\
  \text{Prep}_nP \\
  \text{Prep}_{n-1}P \\
\end{array}
\]

I will abstract away for the moment from arguments and take a reduced VP shell of the form (overt material is presented in bold face):

\[
\begin{array}{c}
  \text{VP} \\
  \text{V'} \\
  \text{V} \\
\end{array} \quad \begin{array}{c}
  \text{V} \\
  \text{Prep}_nP \\
  \text{Prep}_{n-1}P \\
\end{array}
\]

I choose the extended form to the left, which is more general, though the complement branch seems entirely unnecessary.

For the prepositional expression I adopt Kayne's analysis with two projections: the PP, which hosts the preposition and the KP, with a case assigning head and the "complement"-DP in its specifier. According to scheme B.2.2, the extended projection has to provide in addition a landing position for the lower PP complex above the PP, which I call LPrepP. A further projection LVP which attracts the verb in its specifier is merged on top. For the minimal structure we get:

\[
\begin{array}{c}
  \text{VP} \\
  \text{V'} \\
  \text{V} \\
\end{array}
\]
At the beginning of the derivation the lowest extended PP projection is merged with the VP $L_{\text{VP}}$.

$L_{\text{VP}}$

$L_{\text{VP}}'$

$L_{\text{VP}}$

$L_{\text{Prep}}P$

$L_{\text{Prep}}$

$L_{\text{Prep}}$

$L_{\text{Prep}}$

$L_{\text{Prep}}$

$L_{\text{Prep}}$

$L_{\text{Prep}}$ does not attract anything, because there is no modifier in a lower cycle. $L_{\text{VP}}$, however attracts the VP with the overt verb.

$L_{\text{VP}}$

$L_{\text{Prep}}$

$L_{\text{Prep}}$

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The overt material of the next extended projection is merged, above the landing position for lower PP material is inserted:

The highest projection of the tree, the $\text{LPrep}_{\text{max}-1}P$, attracts the lower overt PP material. The minimal projection which contains this and only this material is the $\text{PP}_{\text{max}}$ itself. The maximal projection is the $\text{LPrep}_{\text{max}}P$. Since at each cycle the whole inverted complex has to be moved up, it is the $\text{LPrep}_{\text{max}}P$ that is attracted.
The next LVP is merged and attracts its lower counterpart $LV_{max}P$. Specifier movement of the VP alone is a possible solution, but attraction of the whole LVP results in a more coherent derivation.
In case of a third PP, the highest extended projection will be merged in an analogous way.
The $\text{LPrep}_{\text{max}-2}$ attracts the lower $\text{LPrepP}$. This time it is clear that attraction of only the PP would not give the correct result:
Finally, the last LVP is merged and attracts $LV_{max-1}$

Now we got the desired result of having the verb in front of a group of inverted PPs. We used only two types of operations during the derivations: Merge of another projection and movement of a complement (no head movement, no specifier movement). The movements were driven by cyclic attractions of similar elements: $LPrep_{n}P$ attracts $LPrep_{n+1}P$, $LV_{n}P$ attracts $LV_{n+1}P$. In the resulting structure we never find overt material in the specifier of an overt head. Note also, that all the movements are cyclic in the sense of Chomsky's extension condition.

5.6.2 Derivation of the direct order

Among the remaining schemes for the direct order, verb final case, A.2.1 b) was the one which came closest to the remaining inverted order scheme. I repeat it her for convenience.
Here, as in the above case of inverted, postverbal PPs, both landing positions are above, but their relative order is reversed. Maintaining the idea of structure universality, this means either that a different landing position of the verb is activated or a different landing position of the prepositional complex. There is another difference to the above case: the actual Prep$_{n-1}$P is attracted to a position above the Prep$_nP$. Certainly, we do not want these two differences to be attributed to two independent parameters. Activating a different landing position of the verb below Prep$_nP$ can not easily be made responsible for the movement of the Prep$_{n-1}$P. If another landing position for the Prep$_nP$ is activated, then this Prep$_nP$ could attract the Prep$_{n-1}$P to its outermost specifier. This means, we do not have to include an additional landing position for the actual PP in its own extended projection. I therefore take the same extended prepositional projection with the addition of further projection above the LVP, which I call PREPP. In English it is empty and has no visible effects. In German, however, it is capable of attracting a lower PrepP. We get for the extended projection:

With this structure the derivation of the German clause structure with preverbal PPs in direct order can be done with exactly the same mechanism as in the English case. The only difference is the first movement of the lowest prepositional material into the specifier of the next higher PREPP. The following steps lead automatically to the expected surface order. Let us start the derivation with this starting point. The VP has moved to the spec of the lowest LV$_{\text{max}}$P, and from there to the second LV$_{\text{max-1}}$P. The lowest LPrep$_{\text{max}}$P sits in the specifier of the PREP$_{\text{max-1}}$P.
Now $\text{LPrep}_{\text{max}} \text{P}$ asymmetrically c-commands $\text{LPrep}_{\text{max}-1} \text{P}$ and attracts it to its specifier.
From this starting point the derivation proceeds as usual. $KP_{\text{max}-2}P$, $P_{\text{max}-2}P$ and $LPrep_{\text{max}-2}P$ are merged. Again, $LPrep_{\text{max}-2}P$ cannot attract neither $LPrep_{\text{max}-1}P$ nor $LPrep_{\text{max}}P$ because they are too deep imbedded in $PREP_{\text{max}-1}P$. $LV_{\text{max}-2}P$, however attracts the lower $LV_{\text{max}-1}P$ with the overt verb.
Next, $\text{PREP}_{\text{max}-2}\text{P}$ is merged and attracts the lower $\text{PREP}_{\text{max}-1}\text{P}$. The latter transports the lower prepositional material.
As last step of this cycle, $\text{LPrep}_{\text{max}-1}\text{P}$ attracts $\text{LPrep}_{\text{max}-2}\text{P}$ to its specifier.

In the same way every higher PP will end up to the left giving thus rise to PPs in direct order in front of the verb. Several problems arise with the derivation presented so far.

- How does is the starting position with $\text{LPrep}_{\text{max}}\text{P}$ in the specifier of $\text{PREP}_{\text{max}}\text{P}$ derived?
- Nearly all movements part from a complement position except for the VP which moves into the spec of $\text{LV}_{\text{max}}\text{P}$ from where it extracts and moves to the spec of $\text{LV}_{\text{max}-1}\text{P}$
- If extraction of the VP out of the specifier position of $\text{LVP}$ is possible, why can $\text{LPrep}_{\text{max}}\text{P}$ be not attracted from specifier position to $\text{LPrep}_{\text{max}-2}\text{P}$?

The following proposal for the first part of the derivation can resolve the problems connected with the movements out of a specifier position.
Above the verb and all arguments I propose a projection PropP as closure of the VP shell. It represents the core proposition, the nuclear event. Its head is unpronounced in German. Abstracting away from argument positions the VP shell is:

This PropP has the same features as the above PREPP which all can be viewed as closures of subevent structure: PropP is the closure of the VP shell, the PREPPs are closures of the extended projections of prepositions or maybe more generally of modifiers. Like other PREPPs PropP can be attracted by higher PREPPs. Furthermore, in German it has a feature in common with the LPrepPs, which permits it to attract LPrepPs, but not to be attracted by them. Above the PropP the lowest prepositional modifier is merged, beginning with $K_{\text{max}}P$, $P_{\text{max}}P$ and $LPrep_{\text{max}}P$.

PropP cannot be attracted by LPrepP. It can only attract other LPrepPs. Therefore, the derivation continues with the Merge of $LV_{\text{max}}P$, which attracts VP.
PREP_{max}P is merged and attracts PropP:
PropP cannot be attracted by LPrepP, but it can attract LPrepP:

The lower part of the next extended prepositional projection is merged with $K_{\text{max}-1}P$, $P_{\text{max}-1}P$, and $L\text{Prep}_{\text{max}-1}P$:
Since PropP cannot be attracted by LPrepP the next LPrepP available for LPrep\textsubscript{max-1}P is LPrep\textsubscript{max}P. Note that this time LPrep\textsubscript{max}P does not sit in the specifier of PREP\textsubscript{max}P but in the specifier of its specifier. We do not need to exclude specifier movement in general in order to prohibit attraction of LPrep\textsubscript{max}P by LPrep\textsubscript{max-1}P. It is sufficient to exclude extraction out of a specifier.

LV\textsubscript{max-1}P is merged next and attracts the lower LV\textsubscript{max}P. It is not necessary to attract VP directly out of its specifier position.
PREP$_{\text{max}-1}$P is merged next and attracts its lower counterpart PREP$_{\text{max}}$P:

where LPrep$_{\text{max}}$P in turn attracts LPrep$_{\text{max}-1}$P
This derivation is cyclically and obeys the C-Command constraint, if we take Kayne's definition of asymmetric C-Command which permits the specifier of a specifier of a projection P to C-Command the head and the complement of the projection P. Furthermore, this derivation has only movements out of a complement position. In all cases elements of a specific cycle attract analogous elements of a cycle below. These properties are shared by the derivation of the English case and the German case. The difference is attributed to the properties of PropP, the closure of the VP shell. Though this element can be present in both languages its properties with respect to attraction differ. In German, PropP can attract a lower LPrepP, in English it cannot. This difference suffices to derive the different word orders of PPs with respect to each other and the verb.

5.6.3 Modifications in order to include morphology

The derivation proposed here resembles in many aspects the ideas presented in Chapter 3 about morphology. For each modifier, be it an affix or a prepositional expression, there is an extended projection with the overt material of the modifier and a landing position of the verb. The Axiom of Word Boundary is respected in both derivations. That means there are no projections that have overt constituents in the specifier and the head if they do not form part of the same word. Movements always start from a complement position.

In the case of having an affix and a PP of the same type, let's say for instance temporal, the interesting question arises, whether they make part of the same extended projection. In a theory that takes all the members of the hierarchy of modifiers to be present in every sentence, it seems plausible to assume that they in fact do sit in the same projection. The SuffP can easily be identified with the LVP of the extended prepositional projection. For the PrefP things do not seem to be that easy. In Chapter 3 it was shown, that it has to sit in a very low position of the extended projection with no overt material below at the time of its movement to the VP, sitting in the SuffP. This posits it below PP and below DP. We have to assume an additional projection PrefP below KP.

Let us assume this projection is present in every extended projection of a prepositional modifier. If its head bears a feature, that permits its attraction to the higher VP, we call it a prefix. If its head is not empty but does not bear this feature, it can be identified with a postposition. In the case of German this would explain the similarity of certain prefixes like "um-" to prepositions. This could give an explanation for Greenbergs Universal 27, which I want to repeat here:

\[ \text{(27a) If a language is exclusively suffixing, it is postpositional} \]
\[ \text{(27b) If it is exclusively prefixing, it is prepositional}. \]

If prefixes and postpositions are in competition for the same position, the Universal follows automatically.

There is another problem in combining the two models. Cyclicity constrained us in the morphological chapter to take the SuffP very high in the extended projection. After the movement of the PrefP to the higher VP, no material of a lower cycle can be moved to a higher position; it had to be moved before to an intermediate position. The same reasoning can be applied to the movement of overt material to PREPP. Since in German the LPrepP, which is higher than the PrefP, has to be moved to a specifier in PREPP, no lower overt material can be left below. This gives PREPP as higher than the SuffP in contradiction to the above constraints. Is there a possibility to resolve this contradiction? At first we can state, that languages of the English type do not have a problem. There is never overt material that has to be transported to a specifier in PREPP. Prefixes that move to a verb,
sitting in the specifier of SuffP can transport the lower empty PREPP without affecting the rest of the derivation.

Next, there is no problem with suffixing. If there is no prefixing, languages of the English type and the German type do not have to respect the condition that SuffP has to be the highest projection to which overt material can be transported.

Problematic is only the case of languages of the German type that have prefixing. If we glance at Greenbergs Universal 4:

With overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional.

and combine it with his Universal 27, we might find the way out of the apparent contradiction. Languages seem to be dividable into two mayor types: OV and VO languages. OV languages are postpositional and according to Universal 27 have no prefixing, German is one representative of them. VO languages have neither a restriction on prefixing nor on pre- or postpositions. They behave like English with respect to modifiers and as we have seen, they do not have any problems with the clash of the two constraints.

So, universally prefixing is excluded as normal way of affixing in languages of the German type. If this turns out to be the correct generalisation, we have to explain the facts, that there are prefixes to be found in German.

But the prefixing in German is in most cases not productive. The only case of productive prefixing is connected with the formation of the past participle. Furthermore, there is a rule, which does not permit more than one prefix in German. It remains to be seen, whether we can account for this behaviour in German within the framework presented here.

5.6.4 Modifications in order to include arguments

Since all arguments are base generated in the VP shell they have to move cyclically up to their final surface position. Therefore, each extended projection has to provide intermediate landing positions for each of them up to their landing position. For the English object with its fixed position after the verb, it can be assumed that it lands in a position between the LPrepP and the SuffP = LVP. Thus, it is transported with the other prepositions from cycle to cycle. Since it is the first in this sequence, its finally position will be directly after the verb. The landing position for the subject must be higher. If further investigations indicate, that it will be above the verbal landing position, I might have to revise the structure for the VP-shell. The easiest way to move the arguments into these landing positions would be to start with a base position of the Object below the verb and the subject above, which is closer to Larson's original proposal. The derivation would then start with this VP-shell:

```
      PropP
         /\      
        /   \    
  Prop'  Prop  V,P
       /       /  
       /     V1' 
      Subj  V1   
             /  
             /   
             V   VP
                / 
               /   
               V'  V'
                  / 
                 /   
                V   Obj
```
Above the first extended modifier will be merged which consists of a landing position for the object LObjP, the LPrepP, a landing position for the verb LVP and a landing position for the subject LSubjP. They are merged cyclically and attract the various parts of the VP-shell in turn:
As closure, the PREPP merges and attracts PropP, which has not effect, since in English, it cannot attract LPrepP.
An extended prepositional expression is merged in the usual way: first an empty PrefP (which is only added here to confirm to the results of Chapter 3), then KP, PP and LPrepP, which attracts its lower counterpart.
The next steps, merge of LVP, LSubjP and PREPP with the attraction of their lower counterparts will be presented in one step:
German starts with the same derivation until the attraction of PropP by the first PREPP. In German, however, this functional projection is able to attract LPrepP.
PrefP, KP, PP and LPrepP are merged without any further consequences. LPrepP cannot attract its lower counterpart, because it is too deep imbedded in PREPP.

The following steps, merge of LVP, LSubjP and PREPP and the attraction of their lower counterparts, will presented here also in one step. Unfortunately, the resulting tree does not fit onto the page and has to be presented in two segments. The dashed line represents the connection between the two parts.
The highest specifier in the tree is represented by a LPrepP, which attracts the lower LPrepP with the prepositional material.

PP, Object and verb appear in the right order. The subject has to go further movements until it reaches its surface position. In main clauses additional movements have to posit the topicalised element in first position and the verb in second position. The exact position of the subject has to be in the focus of further research, as well as the movements in the left periphery. Maybe this research will show that the restriction to movements out of complement position is not valid for this area.

5.6.5 Recursive Extended Projections and Event Structure

So far, the attempt to develop a derivational model without head movement and post Spell Out rising of the verb resulted in a very rich structure assigned to every prepositional modifier. This might seem at first sight contra intuitive, but becomes more obvious if we take into consideration the ideas about extended projections presented in Chapter 2. Crosslinguistic data suggest that lexical verbs and nouns project a rich structure which consists of a low argumental part corresponding to the VP shell, a middle field of modification (roughly the old IP) and a higher area related to pragmatic functions like
information structure and illocutionary force in the case of verbal projections and deixis in the case of nouns. If we extend this structure to the case of prepositional modifiers we get an explanation for the rich structure.

We expect for each modifier an extended projection consisting of three parts: a lower argumental part, a middle field for further modifiers and a higher field for pragmatic elements.

The argumental part consists of the main predicate of the PP and its arguments. We expect the positions of the arguments in relation to their predicate to be alike for all kinds of predicates. Thus, the structure we have to stipulate for the argumental part of prepositional modifiers depends on our choice for the VP shell.

If we chose a VP shell model with the object in a complement position of the verb, we are led to view the prepositions as as predicates. If we take a sentence like:

*John read a book in Venice.*

we can view the preposition "in" as a predicate with two arguments, the DP "in Venice" and the event "John read a book":

\[
\text{in}((\text{ev} \text{John read a book}), [\text{DP Venice}])
\]

The DP "Venice" can be viewed as the object of the preposition and is found inside the KP which is in complement position of the P. To strengthen this analogy we can posit the verbal object in the specifier of a V2P which is the complement of V.

The event "John read a book" has to be represented by some structural node above the overt part of the VP shell, I will call it evP and posit it somewhere below PropP. This node has to move up into a position from where it C-commands locally the preposition. I take this to be the specifier of a projection called ArgP, which is merged above PP. We thus get in analogy for the VP shell and the argumental space of the prepositions:

![Diagram](image)

If we assume a VP shell with the verb in the lowest position and all arguments above, we expect an analogous structure for prepositional modifiers. In Kayne's proposal, prepositions are base generated higher than their DP – "complements". Thus, they cannot be the predicates. The lowest projections in each prepositional field so far have been the PrefPs which were related to prefixes or postposition. Let us assume that they constitute the predicates. In the case of the above example
John read a book in Venice.

it is not the preposition "in" but the lower abstract head of the PrefP, which in this case could be called PLACE. We might view this as a predicate with three arguments which states that there is a locative relation between a DP and an event. The preposition "in", which specifies this local relation, is the third argument. We thus would get:

PLACE ([ev, John read a book], [PP in], [DP Venice])

The two structures for the verbal and prepositional argumental space would be:

In the following I want to give schematic derivations for the two PPs in the English and German case starting from a position after Merge of the lowest PP with all subsequent moves from below. PrefP will be left out for reasons of space.

In English I start with:
Arg_{max-1}P attracts the lower ev_{max-1}P into its specifier. The event projections transport the overt prepositional material.

The rest of the derivation continues as described above. LV_{max-1}P is merged and attracts the verbal component. I will end the derivation here.

For the German case we need a projection between evP and ArgP, which is attracted to PREPP. I will call it for convenience again LPreP. Then, after the first cycle, the lowest LPreP sits in the specifier of PropP, sitting itself in the specifier of the lowest PREPP:
The next prepositional extended projection is merged. \( \text{Arg}_{\text{max}}^{\text{P}} \) attracts the lower \( \text{ev}_{\text{max}}^{\text{P}} \) which is vacuous but satisfies the argumental need of the higher predicate.
LPrepP, EvP, LVP and PREPP are merged next and attract their lower counterparts.
LPrep_{max} P attracts the lower LPrep_{max-1} P

Thus, there is a repetitive movement of lower event projections into higher argument positions. This movement could trigger part of the other movements from cycle to cycle.

Above the argumental shell we expect the modifier part. A candidate for a modifier can be seen in the following sentence:

John met Jane in Venice in St. Marks Square.

"in St. Marks Square" specifies the locative expression, makes it more precise. Unfortunately it appears behind the expression it modifies. Since rightward movement is excluded in an antisymmetric framework, the PP "in Venice" must have moved across it. If the preposition P is directly attached to the main projection line, it cannot move across a higher modifier without pied piping all material below. If it waits until all lower overt material (besides the KP) has been moved up, the movement across the modifier would be to a lower position than the highest projection, therefore not obeying cyclicity. How can we account for this movement?
If we take the modifier to be base generated as ModP somewhere above the ArgP and below the evP and the LPrepP, then we have for both types of derivation a step where evP or LPrepP sit in the highest specifier. For English this would be:
In the German case the relevant step would be:

In both structures the lower $P_{\text{max}}$ can climb to the highest specifier across the modifier. The details must be worked out. In the German case, the resulting structure most still provide an attracting highest modifier for the movement of the next LPrepP.

But the interesting aspect, that climbing across the modifier results in both languages in the same order:

John met Jane in Venice in St. Marks Square.
John traf Jane in Venedig auf dem Markus Platz

If we find the narrower locative description to the left:

John met Jane in Venice in Italy.
John traf Jane in Venedig in Italien.

we get in both cases a contrastive interpretation: it was Venice in Italy, not Venice in California, where they met. I will take "in Italy" not as a modifier of the PP "in Venice" but as a modifier of the DP "Venice" alone. It specifies which Venice was ment.

Another example for modification is provided by the sentence:
A plane was flying **high** above the bell tower.

The degree adverb *high* does not seem to modify the whole prepositional expression "above the bell tower", it rather modifies the bare preposition *P*. If this turns out to be right, we have to revise the base structure for the lower part of the extended projection. Above the KP we find an RelP which give the exact kind of Relation between the event and the DP. In its specifier we find the extended PP with the preposition at the bottom and a degree phrase on top:

This structure would go well with the idea of having a PLACE predicate with three arguments, all sitting in specifier positions above.

The highest part of the extended projection for modifiers is provided by the "pragmatic shell". Here we find landing positions for the subject and the objects. Evidence for these positions comes from quantifier floating. Certain operators that quantify the subject and the object can be found in all intermediate positions of the argument movements. In German we can find the quantifier "alle" between each prepositional modifier:

**Alle** Jungen haben am Sonntag in der Kirche gesungen.
All boys have on Sunday in the church sung
All the boys sang in the church on Sunday.

Die Jungen haben **alle** am Sonntag in der Kirche gesungen.
Die Jungen haben am Sonntag **alle** in der Kirche gesungen.
Die Jungen haben am Sonntag in der Kirche **alle** gesungen.

also for the object:

Hans hat am Sonntag in der Kirche **alle** Lieder gesungen.
Hans has on Sunday in the church **all** songs sung
Hans sang all songs in the church on Sunday.
Hans hat **alle** Lieder am Sonntag in der Kirche gesungen.
Hans hat die Lieder **alle** am Sonntag in der Kirche gesungen.
Hans hat die Lieder am Sonntag **alle** in der Kirche gesungen.
Hans hat die Lieder am Sonntag in der Kirche **alle** gesungen.

A derivation, which excludes specifier movement must provide at each circle additional landing positions for elements that move into the left periphery if they bear a wh-feature or are focussed or topicalised. If for any reason, these elements cannot move to the left periphery they can be interpreted in their low position. Therefore, we expect low focus and low topics.

The considerations of this section could only scotch certains outlines of what a theory with recursive extended projections and cyclic movement can yield. Closer look on empirical data and deeper insight in theoretical issues will help to bring the pieces together.
6 Conclusion

I tried to show with certain empirical test that there is syntactic hierarchy of thematic roles above the VP shell. This hierarchy can be combined with the Cinque Hierarchy of adverbs, affixes and auxiliaries to a field of modifiers between the CP layer and the VP shell. These three layers are commonly viewed as the extended projection of the verb.

A similar partitioning can be found for the DP. Base generated low we find the lexical predicate, above modifiers and in the uppermost layer projections related to more pragmatic functions.

Generalising this partitioning to modifiers we expect a much richer structure for each modifier than assumed before. Only part of this structure is filled with visible elements that are base generated in this area. Other constituents are moved from below and many move further on. It seems that some of the movements are attributed to the different roles a constituent plays in a sentence. A DP for instance can be an agent, a topic and the subject at the same time. In order to establish these roles it has to move in certain positions, which are related to these functions. Other more abstract constituents are related to the event structure. If a sentence has a recursive structure of predications where events are arguments for higher predicates, which become arguments of even higher predicates, more internal movement has to take place. If we accept this picture a rich syntactic structure and a high number of movements appear to be natural.

I started with very general considerations about the syntactic differences between suffixes and prefixes and how to account for different surface orders for prepositional expression. Very few restrictions – antisymmetry, only XP movement, cyclicity of derivations and C-Command Constraint for traces – together with general problems with verb second languages (why does the verb in German dependent clauses not move up at least to TP?) lead me to a model of cyclic verb movements around the modifier space. It turned out, that we do not need movements out of a specifier position for all processes relevant in the work here. If we can generalise this behaviour to a general constraint, which prohibits specifier movements, we can derive the Axiom of Word Boundary, which I had to stipulate in order to explain certain morphological data. This Axiom states that there is no word boundary between overt elements in a head and its specifier. It opens a way of integrating great parts of morphology into syntax. The research led me far beyond the original scope of investigating whether and how prepositional modifiers can be related to the Cinque Hierarchy. It showed how structure and movement can be more restricted to general principles with the price of a richer structure. It opens up a new view on old problems, but it remains to be seen whether the theory is powerful enough to explain the data of languages and – even more important – whether it is restrictive enough to exclude data which we do not find in human languages.

The open questions below are among many that remain to be researched:

- Can the morphological approach be extended to include phenomena such as template morphology, ablaut, reduplication?
- Is there an easy way to derive the different patterns of verb auxiliary complexes in German and Dutch, whose great variation has puzzled linguists for a long time?
- How do we have to include subjects and objects into the model?
- Do the syntactic tests distinguish different subject and object types according to their thematic role?
- How can we account for the different behaviour of adverbs and prepositions in English?
- How are marked surface orders of PPs derived?
- Can we refine the internal structure of the extended projection related to modifying PPs? Can we give a better map for their argumental, their modifier and their pragmatic part?

Continuing this path of research will show, whether it will lead to a consistent theory with great descriptive and explanatory power.
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A Appendix A Three Syntactic Test For The German Mittelfeld

I ordered the results for the three tests by thematic roles. For the basic sentences in German I gave word by word translations as well as translations, which cover the sense of the German sentence. I take the order of modifying PPs in English to be the reversed of the German order, which will be reflected in the translations. Some exceptions are made, especially with the evidential construction "according to", which will be found at the beginning of the sentence. Some examples were furnished with a background text in order to have sentences that were better to judge.

A.1 Pure Adverbials

A.1.1 Temporal

A.1.2 Benefactive

A.1.2.1 Benefactive – Temporal

A.1.2.1.1 Quantifier Scope

Ich habe an mindestens einem Tag für jeden Chef gearbeitet.
I have on at least one day for every boss worked
'I have worked for every boss on at least one day.'

\[ \exists \text{ (time)} \forall \text{ (beneficiary)} \]

Ich habe für mindestens einen Chef an jedem Tag gearbeitet.
∀ (time) ∃ (beneficiary)
∀ (beneficiary) ∃ (time)

\[ \forall \text{ (time)} \exists \text{ (beneficiary)} \]

Ich habe für jeden Chef an mindestens einem Tag gearbeitet.
∀ (beneficiary) ∃ (time)
∃ (time) ∀ (beneficiary)

\[ \forall \text{ (time)} \exists \text{ (beneficiary)} \]

Ich habe an jedem Tag für mindestens einen Chef gearbeitet.
∀ (time) ∃ (beneficiary)
?? ∃ (beneficiary) ∀ (time)

Result(QS)

\[ (1,2,0,0,0,0) \quad \text{Temporal} > \text{Benefactive} \]
A.1.2.1.2 Pair-List Reading

An welchem Tag hat er für jeden Chef gearbeitet?

→ Für welchen Chef hat er an jedem Tag gearbeitet?

Result (PLR)

Temporal > Benefactive

A.1.2.1.3 Informational Focus

Hans hat am Freitag für Herrn Müller gearbeitet.
Hans has on Friday for Mr. Miller worked
'Hans has worked for Mr. Miller on Friday.'

Für wen hat Hans am Freitag gearbeitet?
Hans hat am Freitag für Herrn Müller gearbeitet.
?? Hans hat für Herrn Müller am Freitag gearbeitet.

Wann hat Hans für Herrn Müller gearbeitet?
Hans hat am Freitag für Herrn Müller gearbeitet.
Hans hat für Herrn Müller am Freitag gearbeitet.

Result (IF)

(2,1) Temporal > Benefactive

A.1.3 Reason

A.1.3.1 Reason – Temporal

A.1.3.1.1 Quantifier Scope

Ich bin in jedem Jahr wegen mindestens einer Krankheit zum Arzt gegangen.
I am in every year because of at least one disease to the doctor gone
'I went to the doctor because of at least one problem every year.'

Ich bin wegen mindestens einer Krankheit in jedem Jahr zum Arzt gegangen.
∃ (reason) ∀ (time)
∀ (time) ∃ (reason)

Ich bin in mindestens einem Jahr wegen jeder Krankheit zum Arzt gegangen.
∃ (time) ∀ (reason)
* ∀ (reason) ∃ (time)

Ich bin in jedem Jahr wegen mindestens einer Krankheit zum Arzt gegangen.
∀ (time) ∃ (reason)
* ∃ (reason) ∀ (time)
Ich bin wegen jeder Krankheit in mindestens einem Jahr zum Arzt gegangen.
\[\exists \text{ (time)} \land \forall \text{ (reason)}\]
\[\forall \text{ (reason)} \lor \exists \text{ (time)}\]

Nachfeld

Ich bin wegen mindestens einer Krankheit zum Arzt gegangen in jedem Jahr.
\[\exists \text{ (reason)} \land \forall \text{ (time)}\]
\[\forall \text{ (time)} \lor \exists \text{ (reason)}\]

Ich bin in mindestens einem Jahr zum Arzt gegangen wegen jeder Krankheit.
\[\exists \text{ (time)} \land \forall \text{ (reason)}\]
\[\forall \text{ (reason)} \lor \exists \text{ (time)}\]

Ich bin in jedem Jahr zum Arzt gegangen wegen mindestens einer Krankheit.
\[\forall \text{ (time)} \lor \exists \text{ (reason)}\]
\[\exists \text{ (reason)} \land \forall \text{ (time)}\]

Ich bin wegen jeder Krankheit zum Arzt gegangen in mindestens einem Jahr.
\[\exists \text{ (time)} \land \forall \text{ (reason)}\]
\[\forall \text{ (reason)} \lor \exists \text{ (time)}\]

**Result (QS)**

(3,3,0,0,1,0) +1 Temporal > Reason

A.1.3.1.2 Pair-List Reading

→ Aus welchem Grund ist er in jedem Jahr zum Arzt gegangen?
In welchem Jahr ist er wegen jeder Krankheit zum Arzt gegangen?

**Result (PLR)**

Temporal > Reason

A.1.3.1.3 Informational Focus

Hans hat die Schule am Samstag wegen einer Klassenarbeit geschwänzt.
Hans has the school on Saturday because of a class test been absent (on purpose).
'Hans was not in school because of a class test on Saturday.'

Wann hat Hans die Schule wegen einer Klassenarbeit geschwänzt?
Hans hat die Schule wegen einer Klassenarbeit am Samstag geschwänzt.
Hans hat die Schule am Samstag wegen einer Klassenarbeit geschwänzt.

Warum hat Hans am Samstag die Schule geschwänzt?
Hans hat die Schule wegen einer Klassenarbeit am Samstag geschwänzt.
Hans hat die Schule am Samstag wegen einer Klassenarbeit geschwänzt.
Result (IF)

(1,0) Temporal > Reason

A.1.3.2 Reason – Benefactive

A.1.3.2.1 Quantifier Scope

Giovanni was the white sheep of the Sicilian family. His brothers had committed robbery, drug smuggling, even murder. Now they were all dead, killed by another family and Giovanni was sitting in the family church praying for them.

Er hat für mindestens einen Bruder wegen jeder Sünde gebetet.
He has for at least one brother because of every sin prayed
'He prayed because of every sin for at least one brother.'

Er hat wegen mindestens einer Sünde für jeden Bruder gebetet.
∃ (beneficiary) ∀ (reason)

Er hat wegen jeder Sünde für mindestens einen Bruder gebetet.
∀ (beneficiary) ∃ (reason)

Er hat für jeden Bruder wegen mindestens einer Sünde gebetet.
∀ (beneficiary) ∃ (reason)

Nachfeld

Dass er für mindestens einen Bruder gebetet hat wegen jeder Sünde, wusste ich nicht.
∃ (beneficiary) ∀ (reason)

Dass er wegen mindestens einer Sünde gebetet hat für jeden Bruder, wusste ich nicht.
* ∃ (reason) ∀ (beneficiary)

Dass er wegen jeder Sünde gebetet hat für mindestens einen Bruder, wusste ich nicht.
* ∀ (beneficiary) ∃ (reason)

Dass er für jeden Bruder gebetet hat wegen mindestens einer Sünde, wusste ich nicht.
∀ (beneficiary) ∃ (reason)

Result (QS)

\[(1,2,0,0,0,0) +1 \text{ Benefactive} > \text{Reason}\]

A.1.3.2.2 Pair-List Reading

→ Warum hat er für jeden Bruder gebetet?
   Für wen hat er wegen jeder Sünde gebetet?

Result (PLR)

Benefactive > Reason

A.1.3.2.3 Informational Focus
Hans was caught in the act while stealing in a shop. The judge ordered him to work for the owner of the shop, Mr. Maier, for several weekends.

Hans hat wegen eines Diebstahls für Herrn Maier gearbeitet.
Hans has because of a theft for Mr. Maier worked.
'Hans worked for Mr. Maier because of his crime.'

Für wen hat Hans wegen eines Diebstahls gearbeitet?
Hans hat wegen eines Diebstahls für Herrn Maier gearbeitet.
Hans hat für Herrn Maier wegen eines Diebstahls gearbeitet.

Warum hat Hans für Herrn Maier gearbeitet?
Er hat für Herrn Maier wegen eines Diebstahls gearbeitet.
? Er hat wegen eines Diebstahls für Herrn Maier gearbeitet.

Result (IF)

\[(0.5,0) \text{ Benefactive} > \text{Reason}\]

A.1.4 Locative

A.1.4.1 Locative – Temporal

A.1.4.1.1 Quantifier Scope

Er hat an mindestens einem Tag in jedem Bett geschlafen.
He has on at least one day in every bed slept
'He slept in every bed on at least one day.'

Er hat an mindestens einem Tag in jedem Bett geschlafen.
\(\exists (\text{time}) \forall (\text{place})\)
\(\forall (\text{place}) \exists (\text{time})\)

Er hat in mindestens einem Bett an jedem Tag geschlafen.
\(\exists (\text{place}) \forall (\text{time})\)
\(\forall (\text{time}) \exists (\text{place})\)
Er hat in jedem Bett an mindestens einem Tag geschlafen.  
\( \forall (\text{place}) \exists (\text{time}) \)  
\( \exists (\text{time}) \forall (\text{place}) \)

Er hat an jedem Tag in mindestens einem Bett geschlafen.  
\( \forall (\text{time}) \exists (\text{place}) \)  
\( \exists (\text{place}) \forall (\text{time}) \)

Er hat an mehr als einem Tag in fast jedem Bett geschlafen.  
M (time) F (place)  
? F (place) M (time)  
Er hat in mehr als einem Bett an fast jedem Tag geschlafen.  
M (place) F (time)  
F (time) M (place)  

Result (QS)  

\((0,2,0,0,0,0)\) Temporal > Locative

A.1.4.1.2 Pair-List Reading  

→ In welchem Bett hat er an jedem Tag geschlafen?  
An welchem Tag hat er in jedem Bett geschlafen?

Result (PLR)  

Temporal > Locative

A.1.4.1.3 Informational Focus  

Hans hat am Sonntag in München geschlafen.  
Hans has on Sunday in Munich slept  
'Hans slept in Munich on Sunday.'  

Wo hat Hans am Sonntag geschlafen?  
Hans hat am Sonntag in München geschlafen.  
?? Hans hat in München am Sonntag geschlafen.

Wann hat Hans in München geschlafen?  
Hans hat in München am Sonntag geschlafen.  
\textbf{Hans hat am Sonntag in München geschlafen.}

Result (IS)  

\((2,1)\) Temporal > Locative
A.1.4.2 Locative – Benefactive

A.1.4.2.1 Quantifier Scope

Er hat für jede Firma in mindestens einer Stadt gearbeitet.
He has for every company in at least one town worked

'He worked in at least one town for every company.'

Er hat in mindestens einer Stadt für jede Firma gearbeitet.
∃ (place) ∀ (beneficiary)

∀ (beneficiary) ∃ (place)

Er hat für mindestens eine Firma in jeder Stadt gearbeitet.
∃ (beneficiary) ∀ (place)

∀ (place) ∃ (beneficiary)

Er hat für jede Firma in mindestens einer Stadt gearbeitet.
∀ (beneficiary) ∃ (place)

∃ (place) ∀ (beneficiary)

Er hat in jeder Stadt für mindestens eine Firma gearbeitet.
∀ (place) ∃ (beneficiary)

∃ (beneficiary) ∀ (place)

Er hat in mehr als einer Stadt für fast jede Firma gearbeitet.
M (place) F (beneficiary)

? F (beneficiary) M (place)

Er hat für mehr als eine Firma in fast jeder Stadt gearbeitet.
M (beneficiary) F (place)

F (place) M (beneficiary)

Result (QS)

(1,1,0,0,1,0) Locative > Benefactive

A.1.4.2.2 Pair-List Reading

→ Für welche Firma hat er in jeder Stadt gearbeitet?

In welcher Stadt hat er für jede Firma gearbeitet?

Result (PLR)

Locative > Benefactive

A.1.4.2.3 Informational Focus

Hans hat in Berlin für Frau Schmidt gearbeitet.
Hans has in Berlin for Mrs. Schmidt worked

'Hans worked for Mrs. Schmidt in Berlin.'
Für wen hat Hans in Berlin gearbeitet?
Hans hat in Berlin für Frau Schmidt gearbeitet.

Wo hat Hans für Frau Schmidt gearbeitet?
Hans hat in Berlin für Frau Schmidt gearbeitet.
Hans hat für Frau Schmidt in Berlin gearbeitet.

Result (IF)

\[(1,0) \quad \text{Locative} > \text{Benefactive}\]

A.1.4.3 Locative – Reason

A.1.4.3.1 Quantifier Scope

Er wurde in mindestens einem Krankenhaus wegen jeder Krankheit behandelt.
He was in at least one hospital because of every disease treated

'In at least one hospital he was treated because of every disease.'

Er hat in mindestens einer Stadt wegen jedem Auftrag gearbeitet.

\[\exists \text{(place)} \quad \forall \text{(reason)}\]

?? \[\forall \text{(reason)} \quad \exists \text{(place)}\]

Er hat wegen mindestens eines Auftrags in jeder Stadt gearbeitet.

\[\exists \text{(reason)} \quad \forall \text{(place)}\]

\[\forall \text{(place)} \quad \exists \text{(reason)}\]

Er hat wegen jedem Auftrag in mindestens einer Stadt gearbeitet.

\[\forall \text{(reason)} \quad \exists \text{(place)}\]

\[\exists \text{(place)} \quad \forall \text{(reason)}\]

Er hat in jeder Stadt wegen mindestens eines Auftrags gearbeitet.

\[\forall \text{(place)} \quad \exists \text{(reason)}\]

?? \[\exists \text{(reason)} \quad \forall \text{(place)}\]

Er wurde in mindestens einem Krankenhaus wegen jeder Krankheit behandelt.

\[\exists \text{(place)} \quad \forall \text{(reason)}\]

?? \[\forall \text{(reason)} \quad \exists \text{(place)}\]

Er wurde wegen mindestens einer Krankheit in jedem Krankenhaus behandelt.

\[\exists \text{(reason)} \quad \forall \text{(place)}\]

\[\forall \text{(place)} \quad \exists \text{(reason)}\]

Er wurde wegen jeder Krankheit in mindestens einem Krankenhaus behandelt.

\[\forall \text{(reason)} \quad \exists \text{(place)}\]

\[\exists \text{(place)} \quad \forall \text{(reason)}\]
Er wurde in jedem Krankenhaus wegen mindestens einer Krankheit behandelt.
\[ \forall \text{ (place) } \exists \text{(reason)} \]
\[ ? \] \[ \exists \text{(reason)} \forall \text{ (place)} \]

Nachfeld

Er wurde in mindestens einem Krankenhaus behandelt wegen jeder Krankheit.
\[ \exists \text{(place)} \forall \text{(reason)} \]
\[ * \] \[ \forall \text{(reason)} \exists \text{(place)} \]

Er wurde wegen mindestens einer Krankheit behandelt in jedem Krankenhaus.
\[ * \] \[ \exists \text{(reason)} \forall \text{(place)} \]
\[ \forall \text{ (place) } \exists \text{(reason)} \]

Er wurde wegen jeder Krankheit behandelt in mindestens einem Krankenhaus.
\[ * \] \[ \forall \text{(reason)} \exists \text{(place)} \]
\[ \exists \text{(place) } \forall \text{(reason)} \]

Er wurde in jedem Krankenhaus behandelt wegen mindestens einer Krankheit.
\[ \forall \text{ (place) } \exists \text{(reason)} \]
\[ * \] \[ \exists \text{(reason)} \forall \text{(place)} \]

Result (QS)

\[ (2,1,0,0,0,0) +1 \quad \text{Locative > Reason} \]

A.1.4.3.2 Pair-List Reading

\[ \rightarrow \text{Wegen welchem Auftrag hat er in jeder Stadt gearbeitet?} \]
\[ \text{In welcher Stadt hat er wegen jedem Auftrag gearbeitet?} \]

\[ \rightarrow \text{Wegen welcher Krankheit wurde er in jedem Krankenhaus behandelt?} \]
\[ \text{In welchem Krankenhaus wurde er wegen jeder Krankheit behandelt?} \]

\[ \rightarrow \text{Aus welchem Grund hat er in jeder Stadt studiert?} \]
\[ \text{In welcher Stadt hat er aus jedem Grund studiert?} \]

Result (PLR)

\text{Locative > Reason}

A.1.4.3.3 Informational Focus

Walter hat in Venedig aus Liebe zur Linguistik studiert.
Walter has in Venice because of love to linguistics studied
'Walter studied because he loved linguistics in Venice.'
Wo hat Walter aus Liebe zur Linguistik studiert?
? Er hat in Venedig aus Liebe zur Linguistik studiert.
Er hat aus Liebe zur Linguistik in Venedig studiert.

Warum hat Walter in Venedig studiert?
Er hat in Venedig aus Liebe zur Linguistik studiert.
Er hat aus Liebe zur Linguistik in Venedig studiert.

Result (IF)

(1,1) Locative > Reason

A.1.5 Instrumental

A.1.5.1 Instrumental – Temporal

A.1.5.1.1 Quantifier Scope

Van Gogh hat an mindestens einem Tag mit jeder Farbe gemalt.
Van Gogh has on at least one day with every colour painted
'Van Gogh painted with every colour on at least one day.'

Van Gogh hat an mindestens einem Tag mit jeder Farbe gemalt.
∃ (time) ∀ (instrument)
? ∀ (instrument) ∃ (time)

Van Gogh hat mit mindestens einer Farbe an jedem Tag gemalt.
∃ (instrument) ∀ (time)
∀ (time) ∃ (instrument)

Van Gogh hat mit jeder Farbe an mindestens einem Tag gemalt.
∀ (instrument) ∃ (time)
∃ (time) ∀ (instrument)

Van Gogh hat an jedem Tag mit mindestens einer Farbe gemalt.
∀ (time) ∃ (instrument)
?? ∃ (instrument) ∀ (time)

Result (QS)

(1,2,0,0,1,0) Temporal > Instrumental

A.1.5.1.2 Pair-List Reading

An welchem Tag hat er mit jedem Pinsel gemalt?

→ Mit welchem Pinsel hat er an jedem Tag gemalt?
Result (PLR)

**Temporal > Instrumental**

**A.1.5.1.3 Informational Focus**

Hans hat das Radio am Freitag mit dem Schraubenzieher repariert.  
Hans has the radio on Friday with the screwdriver repaired  
'Hans repaired the radio with the screwdriver on Friday.'

Wann hat Hans das Radio mit dem Schraubenzieher repariert?  
**Hans hat das Radio am Freitag mit dem Schraubenzieher repariert.**  
Hans hat das Radio mit dem Schraubenzieher am Freitag repariert.

Womit hat Hans das Radio am Freitag repariert?  
Hans hat das Radio mit dem Schraubenzieher repariert.  
?? Hans hat das Radio mit dem Schraubenzieher am Freitag repariert.

Result (IF)

**(2,1) Temporal > Instrumental**

**A.1.5.2 Instrumental – Benefactive**

**A.1.5.2.1 Quantifier Scope**

Picasso hat für jeden Auftraggeber mit mindestens einem breiten Pinsel gemalt.  
Picasso has for every client with at least one thick brush painted  
'Picasso painted with at least one thick brush for every client.'

Picasso hat mit mindestens einem breiten Pinsel für jeden Auftraggeber gemalt.  
∃ (instrument) ∀(beneficiary)  
∀(beneficiary) ∃ (instrument)

Picasso hat für mindestens einen Auftraggeber mit jedem breiten Pinsel gemalt.  
∃ (beneficiary) ∀ (instrument)  
∀ (instrument) ∃ (beneficiary)

Picasso hat für jeden Auftraggeber mit mindestens einem breiten Pinsel gemalt.  
∀ (beneficiary) ∃ (instrument)  
?? ∃ (instrument) ∀(beneficiary)

Picasso hat mit jedem breiten Pinsel für mindestens einen Auftraggeber gemalt.  
∀ (instrument) ∃ (beneficiary)  
∃ (beneficiary) ∀ (instrument)

Result (QS)

**(0,2,0,0,1,0) Benefactive > Instrumental**
A.1.5.2.2 Pair-List Reading

Für welchen Auftraggeber hat er mit jedem Pinsel gemalt?

→ Mit welchem Pinsel hat er für jeden Auftraggeber gemalt?

Result (PLR)

Benefactive > Instrumental

A.1.5.2.3 Informational Focus

Hans hat das Radio für Herrn Mayer mit einem Schraubenzieher repariert.
Hans has the radio for Mr. Mayer with a screwdriver repaired
'Hans repaired the radio with a screwdriver for Mr. Mayer.'

Für wen hat Hans das Radio mit einem Schraubenzieher repariert?
Er hat das Radio mit einem Schraubenzieher für Herrn Meier repariert.
Er hat das Radio für Herrn Maier mit einem Schraubenzieher repariert.

Mit was hat Hans das Radio für Herrn Mayer repariert?
?? Er hat das Radio mit einem Schraubenzieher für Herrn Mayer repariert.
Er hat das Radio für Herrn Mayer mit einem Schraubenzieher repariert.

Result (IF)

(2,0) Benefactive > Instrumental

A.1.5.3 Instrumental – Reason

A.1.5.3.1 Quantifier Scope

Der Zahnarzt hat wegen mindestens eines Loches mit jedem Bohrer gearbeitet.
The dentist has because of at least one cavity with every drill worked
'Because of at least one cavity the dentist was forced to use all of his drills.'

Der Zahnarzt hat wegen mindestens eines Loches mit jedem Bohrer gearbeitet.
∃ (reason) ∀ (instrument)
?
∀ (instrument) ∃ (reason)

Der Zahnarzt hat mit mindestens einem Bohrer wegen jedem* Loch gearbeitet.
∃ (instrument) ∀ (reason)
∀ (reason) ∃ (instrument)

Der Zahnarzt hat mit jedem Bohrer wegen mindestens eines Loches gearbeitet.
∀ (instrument) ∃ (reason)
∃ (reason) ∀ Instrument

Der Zahnarzt hat wegen jedem Loch mit mindestens einem Bohrer gearbeitet.
∀ (reason) ∃ (instrument)
?? ∃ (instrument) ∀ (reason)
* "wegen" can be used with Dative DPs and Genitive DPs. I normally use Genitive, but this sounds awful with "jeder": "*wegen jedes Loches"

Nachfeld

Der Zahnarzt hat wegen mindestens eines Loches gearbeitet mit jedem Bohrer.
∃ (reason) ∀ (instrument)
* ∀ (instrument) ∃ (reason)

Der Zahnarzt hat mit mindestens einem Bohrer gearbeitet wegen jedem Loch.
* ∃ (instrument) ∀ (reason)
∀ (reason) ∃ (instrument)

Der Zahnarzt hat mit jedem Bohrer gearbeitet wegen mindestens eines Loches.
* ∀ (instrument) ∃ (reason)
∃ (reason) ∀ (Instrument)

? Der Zahnarzt hat wegen jedem Loch gearbeitet mit mindestens einem Bohrer.
∀ (reason) ∃ (instrument)
?? ∃ (instrument) ∀ (reason)

Result (QS)

(1,2,0,0,0,0) +1 Reason > Instrumental

A.1.5.3.2 Pair-List Reading

Wegen welchem Loch hat er mit jedem Bohrer gearbeitet?

→ Mit welchem Bohrer hat er wegen jedem Loch gearbeitet?

Result (PLR)

Reason > Instrumental

A.1.5.3.3 Informational Focus

Der Zahnarzt arbeitete wegen eines Loches mit einem Bohrer.
'The dentist worked with a drill because of a cavity.'

Warum arbeitete der Zahnarzt mit einem Bohrer.
Der Zahnarzt arbeitete mit einem Bohrer wegen eines Loches.
Der Zahnarzt arbeitete wegen eines Loches mit einem Bohrer.

Mit was arbeitete der Zahnarzt wegen eines Loches?
? Der Zahnarzt arbeitete mit einem Bohrer wegen eines Loches.
Der Zahnarzt arbeitete wegen eines Loches mit einem Bohrer.

Result (IF)

(1,0) Reason > Instrument
A.1.5.4 Instrumental – Locative

A.1.5.4.1 Quantifier Scope

Van Gogh hat mit mindestens einem Pinsel in jeder Stadt gemalt.
'Van Gogh has with at least one brush in every city painted'

Van Gogh hat mit mindestens einem Pinsel in jeder Stadt gemalt.
\( \exists \) (instrument) \( \forall \) (place)

Van Gogh hat mit mindestens einem Pinsel in jeder Stadt gemalt.
\( \forall \) (place) \( \exists \) (instrument)

Van Gogh hat in mindestens einer Stadt mit jedem Pinsel gemalt.
\( \exists \) (place) \( \forall \) (instrument)

Van Gogh hat in jeder Stadt mit mindestens einem Pinsel gemalt.
\( \forall \) (place) \( \exists \) (instrument)

Van Gogh hat mit jedem Pinsel in mindestens einer Stadt gemalt.
\( \exists \) (place) \( \forall \) (instrument)

Result (QS)

\((1,2,0,0,0,0)\)  Locative > Instrumental

A.1.5.4.2 Pair-List Reading

→ Mit welchem Pinsel hat er in jeder Stadt gemalt?

In welcher Stadt hat er mit jedem Pinsel gemalt?

Result (PLR)

Locative > Instrumental

A.1.5.4.3 Informational Focus

Van Gogh zeichnete in Arles mit Tusche.
'Van Gogh painted with Indian ink in Arles.'

Wo zeichnete Van Gogh mit Tusche?
Van Gogh zeichnete mit Tusche in Arles.
\textbf{Van Gogh zeichnete in Arles mit Tusche.}

Mit was zeichnete van Gogh in Arles?
Van Gogh zeichnete in Arles mit Tusche.
\? Van Gogh zeichnete mit Tusche in Arles.
Result (IF)

(1,1) Locative > Instrumental

A.1.6 Manner

A.1.6.1 Manner – Temporal

A.1.6.1.1 Quantifier Scope

Robert kannte verschiedene Arten, eine Frau zu verführen.
Bob knew different methods to seduce a woman.

Er hat es an mindestens einem Tag auf jede Art versucht.
He has it on at least one day in all ways tried
'He tried it every way on at least one day.'

Er hat es an mindestens einem Tag auf jede Art versucht.
∃ (time) ∀ (Manner)
* ∀ (Manner) ∃ (Temporal)

Er hat es auf mindestens eine Art an jedem Tag versucht.
∀ (Manner) ∃ (Temporal)
∃ (Manner) ∀ (time)

Er hat es auf jede Art an mindestens einem Tag versucht.
∀ (Manner) ∃ (Temporal)
∃ (time) ∀ (Manner)

Er hat es an jedem Tag auf mindestens eine Art versucht.
∀ (time) ∃ (Manner)
* ∃ (Manner) ∀ (time)

Result (QS)

(3,3,0,0,1,1) Temporal > Manner

A.1.6.1.2 Pair-List Reading

→ Auf welche Art hat er es an jedem Tag versucht?

An welchem Tag hat er es auf jede Art versucht?

Result (PLR)

Temporal > Manner
A.1.6.1.3 *Informational Focus*

Hans hat den Kuchen am Freitag auf seine ganz besondere Art gebacken.
Hans has the cake on Friday in his very special way baked
'Hans baked the cake in his very special way on Friday.'

Wann hat Hans den Kuchen auf seine ganz besondere Art gebacken?
Hans hat den Kuchen *am Freitag auf seine ganz besondere Art gebacken.*
Hans hat den Kuchen auf seine ganz besondere Art *am Freitag* gebacken.

Wie hat Hans den Kuchen am Freitag gebacken?
Hans hat den Kuchen auf seine ganz besondere Art gebacken.
* Hans hat den Kuchen *auf seine ganz besondere Art* am Freitag gebacken.

**Result (IF)**

(3,1) Temporal > Manner

A.1.6.2 *Manner – Benefactive*

A.1.6.2.1 *Quantifier Scope*

Er hat für mindestens einen Präsidenten auf jede Art (die er kannte) betrogen.
He has for at least one president in every way deceived
'To the benefit of at least one president, he was deceiving in every way (that he knew how).'

Er hat für mindestens einen Präsidenten auf jede Art betrogen.
∃(beneficiary) ∀(manner)
* ∀(manner) ∃(beneficiary)

Er hat auf mindestens eine Art für jeden Präsidenten betrogen.
∃(manner) ∀(beneficiary)
∀(beneficiary) ∃(manner)

Er hat auf jede Art für mindestens einen Präsidenten betrogen.
∀(manner) ∃(beneficiary)
∃(beneficiary) ∀(manner)

Er hat für jeden Präsidenten auf mindestens eine Art betrogen.
∀(beneficiary) ∃(manner)
* ∃(manner) ∀(beneficiary)

**Result (QS)**

(3,3,0,0,1,1) Benefactive > Manner
A.1.6.2.2 Nachfeld

Er hatte für mindestens einen Präsidenten betrogen auf jede Art.
∃(beneficiary) ∀(manner)
* ∀(manner) ∃(beneficiary)

Er hatte auf mindestens eine Art betrogen für jeden Präsidenten.
∀(beneficiary) ∃(manner)
* ∃(manner) ∀(beneficiary)

Er hatte auf jede Art betrogen für mindestens einen Präsidenten.
* ∀(manner) ∃(beneficiary)
∃(beneficiary) ∀(manner)

Er hatte für jeden Präsidenten betrogen auf mindestens eine Art.
∀(beneficiary) ∃(manner)
* ∃(manner) ∀(beneficiary)

A.1.6.2.3 Pair-List Reading

Für welchen Präsidenten hat er auf jede Art betrogen?

→ Auf welche Art hat er für jeden Präsidenten betrogen?

Result (PLR)

Benefactive > Manner

A.1.6.2.4 Informational Focus

Hans hat den Kuchen für Gabi auf seine ganz besondere Art gebacken.
Hans has the cake for Gabi in his very special way baked.
'Hans baked the cake in his very special way for Gabi.'

Für wen hat Hans den Kuchen auf seine ganz besondere Art gebacken?
Hans hat den Kuchen für Gabi auf seine ganz besondere Art gebacken.
Hans has the cake on his very special way for Gabi.

Wie hat Hans den Kuchen für Gabi gebacken?
Hans hat den Kuchen für Gabi auf seine ganz besondere Art gebacken.
* Hans hat den Kuchen auf seine ganz besondere Art für Gabi gebacken.

Result (IF)

(3,1) Benefactive > Manner
A.1.6.3 Manner – Reason

A.1.6.3.1 Quantifier Scope
John had symptoms of different diseases and he knew, that there were different ways to treat them, like massage, injections and physiotherapy.

Der Arzt hat ihn wegen mindestens einer Krankheit auf jede Art behandelt.
The doctor has him because of at least one disease in every way treated
'The doctor treated him in every way because of at least one disease.'

Der Arzt hat ihn wegen mindestens einer Krankheit auf jede Art behandelt.
∃ (reason) ∀ (Manner)
∀ (Manner) ∃ (reason)

Der Arzt hat ihn auf jede Art wegen mindestens einer Krankheit behandelt.
∃ (reason) ∀ (Manner)
∀ (Manner) ∃ (reason)

Der Arzt hat ihn auf mindestens eine Art wegen jeder Krankheit behandelt.
∃ (Manner) ∀ (reason)
∀ (reason) ∃ (Manner)

Der Arzt hat ihn wegen jeder Krankheit auf mindestens eine Art behandelt.
∀ (reason) ∃ (Manner)
?? ∃ (Manner) ∀ (reason)

Nachfeld

Der Arzt hat ihn wegen mindestens einer Krankheit behandelt auf jede Art.
∃ (reason) ∀ (Manner)
*
∀ (Manner) ∃ (reason)

Der Arzt hat ihn auf jede Art behandelt wegen mindestens einer Krankheit.
∃ (reason) ∀ (Manner)
*
∀ (Manner) ∃ (reason)

Der Arzt hat ihn auf mindestens eine Art behandelt wegen jeder Krankheit.
* ∃ (Manner) ∀ (reason)
∀ (reason) ∃ (Manner)

Der Arzt hat ihn wegen jeder Krankheit behandelt auf mindestens eine Art.
∀ (reason) ∃ (Manner)
?
∃ (Manner) ∀ (reason)

Result (QS)

(1,2,0,0,1,0) +1 Reason > Manner
A.1.6.3.2 Pair-List Reading

→ Auf welche Art hat er ihn wegen jeder Krankheit behandelt?

Wegen welcher Krankheit hat er ihn auf jede Art behandelt?

Result (PLR)

Reason > Manner

A.1.6.3.3 Informational Focus

Rummenigge hat wegen seiner Verletzung auf besondere Art gespielt.
Rummenigge has because of his injury in special way played
'Rummenigge played in a special way because of his injury.'

Warum hat Rummenigge auf besondere Art gespielt?
Er hat wegen seiner Verletzung auf besondere Art gespielt.
Er hat wegen seiner Verletzung auf besondere Art gespielt.
Er hat wegen seiner Verletzung auf besondere Art gespielt.
* Er hat auf besondere Art wegen seiner Verletzung gespielt.

Result (IF)

(3,1) Reason > Manner

A.1.6.4 Manner – Locative

A.1.6.4.1 Quantifier Scope
During the summer break Boris practised some new techniques.

Boris hat in mindestens einer Stadt auf jede Weise gespielt.
Boris has in at least one city in every way played
'Boris played with every technique in at least one city.'

Boris hat in mindestens einer Stadt auf jede Weise gespielt.
∃ (place) ∀ (manner)
?? ∀ (manner) ∃ (place)

Boris hat auf mindestens eine Weise in jeder Stadt gespielt.
∃ (manner) ∀ (place)
∀ (place) ∃ (manner)

Boris hat auf jede Weise in mindestens einer Stadt gespielt.
∀ (manner) ∃ (place)
∃ (place) ∀ (manner)
Boris hat in jeder Stadt auf mindestens eine Weise gespielt.

∀ (place) ∃ (manner)

* ∃ (manner) ∀ (place)

Result (QS)

(2,3,0,0,0,1)  Locative > Manner

A.1.6.4.2 Pair-List Reading

→ Auf welche Art hat er in jeder Stadt gespielt?

In welcher Stadt hat er auf jede Art gespielt?

Result (PLR)

Locative > Manner

A.1.6.4.3 Informational Focus

Boris hat in Wimbledon auf seine ganz spezielle Weise gespielt.
Boris has in Wimbledon in his very special way played
'Boris played in his very special way in Wimbledon.'

Wie hat Boris in Wimbledon gespielt?
Boris hat in Wimbledon auf seine ganz spezielle Weise gespielt.
* Boris hat auf seine ganz spezielle Weise in Wimbledon gespielt.

Wo hat Boris auf seine ganz spezielle Weise gespielt?
Boris hat in Wimbledon auf seine ganz spezielle Weise gespielt.
Boris hat auf seine ganz spezielle Weise in Wimbledon gespielt.

Result (IF)

(3,1)  Locative > Manner

A.1.6.5 Manner – Instrumental

A.1.6.5.1 Quantifier Scope

Er hat das Holz mit mindestens einem Messer auf jede Weise bearbeitet.
He has the wood with at least one knife in every way worked
'He worked the wood in every way with at least one knife.'

Er hat das Holz mit mindestens einem Messer auf jede Weise bearbeitet.
∃ (instrument) ∀ (manner)

? ∀ (manner) ∃ (instrument)

Er hat das Holz auf mindestens eine Weise mit jedem Messer bearbeitet.
∃ (manner) ∀ (instrument)
∀ (instrument) ∃ (manner)
Er hat das Holz auf jede Weise mit mindestens einem Messer bearbeitet.
\( \forall \text{(manner)} \exists \text{(instrument)} \)
\( \exists \text{(instrument)} \forall \text{(manner)} \)

Er hat das Holz mit jedem Messer auf mindestens eine Weise bearbeitet.
\( \forall \text{(instrument)} \exists \text{(manner)} \)
\( \exists \text{(manner)} \forall \text{(instrument)} \)

Result (QS)

\((1,1,0,0,0,0)\) **Instrumental > Manner**

A.1.6.5.2 Pair-List Reading

Mit welchem Messer hat er das Holz auf jede Art behandelt?

\[ \rightarrow \] Auf welche Art hat er das Holz mit jedem Messer behandelt?

Result (PLR)

**Instrumental > Manner**

A.1.6.5.3 Informational Focus

Hans hat das Holz mit einem Messer auf seine spezielle Art bearbeitet.

Hans hat das Holz mit einem Messer **auf seine spezielle Art** bearbeitet.

Wie hat Hans das Holz mit einem Messer bearbeitet?

Hans hat das Holz mit einem Messer **auf seine spezielle Art** bearbeitet.

Mit was hat Hans das Holz auf seine spezielle Art behandelt.

Hans hat das Holz **mit einem Messer** auf seine spezielle Art bearbeitet.

Result (IF)

\((1,0)\) **Instrumental > Manner**

A.1.7 Comitative

A.1.7.1 Comitative – Temporal

A.1.7.1.1 Quantifier Scope

Ich habe mit mindestens einem Kollegen an jedem Tag gearbeitet.

I have with at least one colleague on every day worked

'I worked with at least one colleague every day.'
Ich habe mit mindestens einem Kollegen an jedem Tag gearbeitet.
∃ (comitative) ∀ (time)
∀ (time) ∃ (comitative)

Ich habe an mindestens einem Tag mit jedem Kollegen gearbeitet.
∃ (time) ∀ (comitative)
? ∀ (comitative) ∃ (time)

Ich habe an jedem Tag mit mindestens einem Kollegen gearbeitet.
∀ (comitative) ∃ (time)
* ∃ (comitative) ∀ (time)

Ich habe an mindestens einem Tag mit jedem Kollegen gearbeitet.
∀ (comitative) ∃ (time)
∀ (time) ∃ (comitative)

Nachfeld

Ich habe mit mindestens einem Kollegen gearbeitet an jedem Tag.
* ∃ (comitative) ∀ (time)
∀ (time) ∃ (comitative)

Ich habe an mindestens einem Tag gearbeitet mit jedem Kollegen.
∃ (time) ∀ (comitative)
* ∀ (comitative) ∃ (time)

Ich habe an jedem Tag gearbeitet mit mindestens einem Kollegen.
∀ (comitative) ∃ (time)
* ∃ (comitative) ∀ (time)

Ich habe mit jedem Kollegen gearbeitet an mindestens einem Tag.
* ∀ (comitative) ∃ (time)
∃ (time) ∀ (comitative)

Result (QS)

(1,3,0,0,1,1) +1 Temporal > Comitative

A.1.7.1.2 Pair-List Reading

→ Mit welchem Kollegen hast du an jedem Tag gearbeitet?
An welchem Tag hast du mit jedem Kollegen gearbeitet?

Result (PLR)

Temporal > Comitative
A.1.7.1.3 Informational Focus

Ich habe am Dienstag mit Hans gearbeitet.
I have on Tuesday with Hans worked
'I worked with Hans on Tuesday.'

Mit wem hast du am Dienstag gearbeitet?
Ich habe am Dienstag mit Hans gearbeitet.
?? Ich habe mit Hans am Dienstag gearbeitet.

Wann hast du mit Hans gearbeitet?
Ich habe am Dienstag mit Hans gearbeitet.
Ich habe mit Hans am Dienstag gearbeitet.

Result (IF)

(2,0) Temporal > Comitative

A.1.7.2 Comitative – Benefactive

A.1.7.2.1 Quantifier Scope

Ich habe mit mindestens einem Freund für jedes Maklerbüro gearbeitet.
I have with at least one friend for every estate agency worked
'I worked for every estate agency with at least one friend.'

Ich habe mit mindestens einem Freund für jedes Maklerbüro gearbeitet.
∃ (comitative) ∀ (beneficiary)
∀ (beneficiary) ∃ (comitative)

Ich habe für mindestens ein Büro mit jedem Freund gearbeitet.
∃ (beneficiary) ∀ (comitative)
? ∀ (comitative) ∃ (beneficiary)

Ich habe für jedes Büro mit mindestens einem Freund gearbeitet.
∀ (beneficiary) ∃ (comitative)
∃ (comitative) ∀ (beneficiary)

Ich habe mit jedem Freund für mindestens ein Büro gearbeitet.
∀ (comitative) ∃ (beneficiary)
? ∃ (beneficiary) ∀ (comitative)

Nachfeld

Dass ich mit mindestens einem Freund gearbeitet habe für jedes Maklerbüro, kann ich beweisen.
∃ (comitative) ∀ (beneficiary)
∀ (beneficiary) ∃ (comitative)
\exists (beneficiary) \forall (comitative)
\forall (comitative) \exists (beneficiary)

Dass ich für jedes Büro gearbeitet habe mit mindestens einem Freund, kann ich beweisen.
\forall (beneficiary) \exists (comitative)
\exists (comitative) \forall (beneficiary)

Dass ich mit jedem Freund gearbeitet habe für mindestens ein Büro, kann ich beweisen.
\forall (comitative) \exists (beneficiary)
\exists (beneficiary) \forall (comitative)

Result (QS)

(0.5,0.5,0,0,1,0) + 0  Comitative > Benefactive

A.1.7.2.2 Pair-List Reading

→ Für welches Büro hast du mit jedem Kollegen gearbeitet?
Mit welchem Kollegen hast du für jedes Büro gearbeitet?

Result (PLR)

Comitative > Benefactive

A.1.7.2.3 Informational Focus

Er hat für "Proktor & Sohn" mit Hermann gearbeitet.
He has for "Proktor & son" with Hermann worked
'He worked for "Proktor & son" with Hermann.'

Mit wem hat er für "Proktor & Sohn" gearbeitet?
Er hat mit Hermann für "Proktor & Sohn" gearbeitet.
Er hat für Proktor & Sohn mit Hermann gearbeitet.

Für wen hat er mit Hermann gearbeitet?
? Er hat für "Proktor & Sohn" mit Hermann gearbeitet.
Er mit Hermann für "Proktor & Sohn" gearbeitet.

Result (IF)

(0.5,0)  Comitative > Benefactive

A.1.7.3 Comitative – Reason

A.1.7.3.1 Quantifier Scope
Dr. Barnard was specialized on heart diseases, but some of them were correlated with neural problems, so he needed some specialists in neurology to operate.
Dr. Barnard hat wegen mindestens einer Krankheit mit jedem Neurologen operiert.
Dr. Barnard has because of least one disease with every neurologist operated
'Dr. Barnard worked with every neurologist because of at least one disease.'

Dr. Barnard hat wegen mindestens einer Krankheit mit jedem Neurologen operiert.
∃ (reason) ∀ (comitative)
∀ (comitative) ∃ (reason)

Dr. Barnard hat mit mindestens einem Neurologen wegen jeder Krankheit operiert.
∃ (comitative) ∀ (reason)
? ∀ (reason) ∃ (comitative)

Dr. Barnard hat wegen jeder Krankheit mit mindestens einem Neurologen operiert.
∀ (reason) ∃ (comitative)
∃ (comitative) ∀ (reason)

Dr. Barnard hat mit jedem Neurologen wegen mindestens einer Krankheit operiert.
∀ (comitative) ∃ (reason)
?? ∃ (reason) ∀ (comitative)

Dr. Barnard hat mit mehr als einem Neurologen wegen fast jeder Krankheit operiert.
M (comitative) F (reason)
F (reason) M (comitative)

Dr. Barnard hat wegen mehr als einer Krankheit mit fast jedem Neurologen operiert.
M (reason) F (comitative)
F (comitative) M (reason)

Nachfeld

Dass Dr. Barnard wegen mindestens einer Krankheit operiert hat mit jedem Neurologen, gilt als erwiesen.
? ∃ (reason) ∀ (comitative)
∀ (comitative) ∃ (reason)

Dass Dr. Barnard mit mindestens einem Neurologen operiert hat wegen jeder Krankheit, gilt als erwiesen.
∃ (comitative) ∀ (reason)
∀ (reason) ∃ (comitative)

Dass Dr. Barnard wegen jeder Krankheit operiert hat mit mindestens einem Neurologen, gilt als erwiesen.
?? ∀ (reason) ∃ (comitative)
∃ (comitative) ∀ (reason)

Dass Dr. Barnard mit jedem Neurologen operiert hat wegen mindestens einer Krankheit, gilt als erwiesen.
∀ (comitative) ∃ (reason)
∃ (reason) ∀ (comitative)
Result (QS)

(1,2,0,0,0,0) + 1 Comitative > Reason

A.1.7.3.2 Pair-List Reading

Mit welchem Neurologen hat er wegen jeder Krankheit operiert?

→ Wegen welcher Krankheit hat er mit jedem Neurologen operiert?

Result (PLR)

Comitative > Reason

A.1.7.3.3 Informational Focus

Dr. Barnard hat wegen Epilepsie mit Dr. Canard operiert.
Dr. Barnard has because of epilepsy with Dr. Canard operated
'Dr. Barnard operated with Dr. Canard because of epilepsy.'

Mit wem hat Dr. Barnard wegen Epilepsie operiert?
Dr. Barnard hat mit Dr. Canard wegen Epilepsie operiert.
Warum hat Dr. Barnard mit Dr. Canard operiert?

Result (IF)

(0.5,0) Comitative > Reason

A.1.7.4 Comitative – Locative

A.1.7.4.1 Quantifier Scope

Ich habe mit mindestens einem Kollegen in jedem Supermarkt Hessens gearbeitet.
I have with at least one colleague in every supermarket of Hessia worked
'I worked in every supermarket of Hessia with at least one colleague.'

Ich habe mit mindestens einem Kollegen in jedem Supermarkt Hessens gearbeitet.
∃ (comitative) ∀ (place)
∀ (place) ∃ (comitative)

Ich habe in mindestens einem Supermarkt mit jedem Kollegen gearbeitet.
∃ (place) ∀ (comitative)
? ∀ (comitative) ∃ (place)

Ich habe in jedem Supermarkt mit mindestens einem Kollegen gearbeitet.
∀ (place) ∃ (comitative)
?? ∃ (comitative) ∀ (place)
Ich habe mit jedem Kollegen in mindestens einem Supermarkt gearbeitet.
∀ (comitative) ∃ (place)
∃ (place) ∀ (comitative)

Ich habe mit mehr als einem Kollegen in fast jedem Supermarkt gearbeitet.
M (comitative) F (place)
F (place) M (comitative)

Ich habe in mehr als einem Supermarkt mit fast jedem Kollegen gearbeitet.
M (place) F (comitative)
? F (comitative) M (place)

Nachfeld

Ich habe mit mindestens einem Kollegen gearbeitet in jedem Supermarkt Hessens.
* ∃ (comitative) ∀ (place)
∀ (place) ∃ (comitative)

Ich habe in mindestens einem hessischen Supermarkt gearbeitet mit jedem Kollegen.
∃ (place) ∀ (comitative)
∀ (comitative) ∃ (place)

Ich habe in jedem Supermarkt gearbeitet mit mindestens einem Kollegen.
∀ (place) ∃ (comitative)
* ∃ (comitative) ∀ (place)

Ich habe mit jedem Kollegen gearbeitet in mindestens einem Supermarkt.
∀ (comitative) ∃ (place)
∃ (place) ∀ (comitative)

Result (QS)
(1,2,0,0,0,0) + 1 Locative > Comitative

A.1.7.4.2 Pair-List Reading

→ Mit welchem Kollegen arbeitete er in jedem Supermarkt?

In welchem Supermarkt arbeitete er mit jedem Kollegen?

Result (PLR)
Locative > Comitative

A.1.7.4.3 Informational Focus

Ich habe in Butzbach mit Franz gearbeitet.
I have in Butzbach with Franz worked
'I worked in Butzbach with Franz.'
Mit wem hast du in Butzbach gearbeitet?
Ich habe in Butzbach mit Franz gearbeitet.
?
Ich habe mit Franz in Butzbach gearbeitet.

Wo hast du mit Franz gearbeitet?
Ich habe in Butzbach mit Franz gearbeitet.
Ich habe mit Franz in Butzbach gearbeitet.

Result (IF)

(0.5,0) Locative > Comitative

A.1.7.5 Comitative – Instrumental
Instrumentals and Comitatives don't go together well if not separated by other material. This can be due to some stylistic or phonetic restriction, which prohibits two adjacent PPs that are introduced by the same preposition, which in this case is "mit". Therefore, I separated the two PPs with additional overt material.

A.1.7.5.1 Quantifier Scope

Ich habe mit mindestens einem Kollegen Autos mit jedem Schraubenschlüssel repariert.
I have with at least one colleague cars with every wrench repaired
'I repaired cars with every wrench with at least one colleague.'

Ich habe mit mindestens einem Kollegen Autos mit jedem Schraubenschlüssel repariert.
∃ (comitative) ∀ (Instrumental)

?? ∀ (Instrumental) ∃ (comitative)

Ich habe mit mindestens einem Schraubenschlüssel Autos mit jedem Kollegen repariert.
∃ (Instrumental) ∀ (comitative)

∀ (comitative) ∃ (Instrumental)

Ich habe mit jedem Schraubenschlüssel Autos mit mindestens einem Kollegen repariert.
∀ (Instrumental) ∃ (comitative)

∃ (comitative) ∀ (Instrumental)

Ich habe mit jedem Kollegen Autos mit mindestens einem Schraubenschlüssel repariert.
∀ (comitative) ∃ (Instrumental)

?? ∃ (Instrumental) ∀ (comitative)

Nachfeld

Ich habe mit mindestens einem Kollegen Autos repariert mit jedem Schraubenschlüssel.
∃ (comitative) ∀ (Instrumental)

* ∀ (Instrumental) ∃ (comitative)

Ich habe mit mindestens einem Schraubenschlüssel Autos repariert mit jedem Kollegen.
* ∃ (Instrumental) ∀ (comitative)

∀ (comitative) ∃ (Instrumental)
Ich habe mit jedem Schraubenschlüssel Autos repariert mit mindestens einem Kollegen.

* ∀ (Instrumental) ∃ (comitative)
∃ (comitative) ∀ (Instrumental)

Ich habe mit jedem Kollegen Autos repariert mit mindestens einem Schraubenschlüssel.
∀ (comitative) ∃ (Instrumental)
* ∃ (Instrumental) ∀ (comitative)

Result (QS)

(2,2,0,0,0) +1 Comitative > Instrumental

A.1.7.5.2 Pair-List Reading

Mit welchem Kollegen hat er mit jedem Schraubenschlüssel Autos repariert?

→ Mit welchem Schraubenschlüssel hat er mit jedem Kollegen Autos repariert?

Result (PLR)

Comitative > Instrumental

A.1.7.5.3 Informational Focus
I do not evaluate here the slight unacceptability of Instrumentals and Comitatives without intervening material. I do not separate them with "oft" or something else, in order to avoid effects, that overlay the pure hierarchical relation.

Ich habe mit Hans mit einer Säge gearbeitet.
I have with Hans with a saw worked.
I worked with Hans with a saw.

Womit hast du mit Hans gearbeitet?
Ich habe mit Hans mit einer Säge gearbeitet.
* Ich habe mit einer Säge mit Hans gearbeitet.

Mit wem hast du mit einer Säge gearbeitet?
Ich habe mit einer Säge mit Hans gearbeitet.
Ich habe mit Hans mit einer Säge gearbeitet.

Result (IF)

(3,1) Comitative > Instrumental

A.1.7.6 Comitative - Manner

A.1.7.6.1 Quantifier Scope

Ich habe mit mindestens einem Kollegen auf jede Art gearbeitet.
I have with at least one colleague in every way worked
'I worked in every way with at least one colleague.'
Ich habe mit mindestens einem Kollegen auf jede Art gearbeitet.
\[ \exists \text{ (comitative)} \forall \text{ (Manner)} \]
? \ \forall \text{ (Manner)} \exists \text{ (comitative)}

Ich habe auf mindestens eine Art mit jedem Kollegen gearbeitet.
\[ \exists \text{ (Manner)} \forall \text{ (comitative)} \]
\[ \forall \text{ (comitative)} \exists \text{ (Manner)} \]

Ich habe auf jede Art mit mindestens einem Kollegen gearbeitet.
\[ \forall \text{ (Manner)} \exists \text{ (comitative)} \]
\[ \exists \text{ (comitative)} \forall \text{ (Manner)} \]

Ich habe mit jedem Kollegen auf mindestens eine Art gearbeitet.
\[ \forall \text{ (comitative)} \exists \text{ (Manner)} \]
?? \ \exists \text{ (Manner)} \forall \text{ (comitative)}

Nachfeld

Ich habe mit mindestens einem Kollegen gearbeitet auf jede Art.
\[ \exists \text{ (comitative)} \forall \text{ (Manner)} \]
* \ \forall \text{ (Manner)} \exists \text{ (comitative)}

Ich habe auf mindestens eine Art gearbeitet mit jedem Kollegen.
\[ \exists \text{ (Manner)} \forall \text{ (comitative)} \]
\[ \forall \text{ (comitative)} \exists \text{ (Manner)} \]

Ich habe auf jede Art gearbeitet mit mindestens einem Kollegen.
* \ \forall \text{ (Manner)} \exists \text{ (comitative)}
\[ \exists \text{ (comitative)} \forall \text{ (Manner)} \]

Ich habe mit jedem Kollegen gearbeitet auf mindestens eine Art.
\[ \forall \text{ (comitative)} \exists \text{ (Manner)} \]
\[ \exists \text{ (Manner)} \forall \text{ (comitative)} \]

Result (QS)

\[(2,1,0,0,0,0) + 1 \quad \text{Comitative > Manner}\]

A.1.7.6.2 Pair-List Reading

Mit welchem Kollegen hat er auf jede Art gearbeitet?

→ Auf welche Art hat er mit jedem Kollegen gearbeitet?

Result (PLR)

Comitative > Manner
A.1.7.6.3 Informational Focus

Hans hat mit Elke auf seine ganz spezielle Weise gearbeitet.
'Hans worked in his very special way with Elke.'

Wie hat Hans mit Elke (zusammen) gearbeitet?
Hans hat mit Elke auf seine ganz spezielle Weise gearbeitet.
* Hans hat auf seine ganz spezielle Weise mit Elke gearbeitet.

Mit wem hat Hans auf seine ganz spezielle Weise gearbeitet?
Hans hat mit Elke auf seine ganz spezielle Weise gearbeitet.
Hans hat auf seine ganz spezielle Weise mit Elke gearbeitet.

Result (IF)

(3,1) Comitative > Manner

A.1.8 Evidential

A.1.8.1 Evidential – Temporal

A.1.8.1.1 Quantifier Scope

Er hat an mindestens einem Tag gemäß jedes Zeugens Schmuck gestohlen.
'He stole jewellery according to every witness on at least one day.'

Er hat an mindestens einem Tag gemäß jedes Zeugens Schmuck gestohlen.
∃(time) ∀(witness)
∀(witness) ∃(time)

Er hat gemäß mindestens eines Zeugens an jedem Tag Schmuck gestohlen.
∃ (witness) ∀(time)
?? ∀(time) ∃ (witness)

Er hat an jedem Tag gemäß mindestens eines Zeugens Schmuck gestohlen.
∀(time) ∃ (witness)
∃ (witness) ∀(time)

Er hat gemäß jedes Zeugen an mindestens einem Tag Schmuck gestohlen.
∀(witness) ∃(time)
* ∃(time) ∀(witness)

Er hat an mindestens einem Tag jedem Zeugen nach Schmuck gestohlen.
∃(time) ∀(witness)
∀(witness) ∃(time)
Er hat mindestens einem Zeugen nach an jedem Tag Schmuck gestohlen.
\[ \exists \text{(witness)} \ \forall \text{(time)} \]

Er hat an jedem Tag mindestens einem Zeugen nach Schmuck gestohlen.
\[ \forall \text{(time)} \ \exists \text{(witness)} \]
\[ \exists \text{(witness)} \ \forall \text{(time)} \]

Er hat jedem Zeugen nach an mindestens einem Tag Schmuck gestohlen.
\[ \forall \text{(witness)} \ \exists \text{(time)} \]
\[ * \ \exists \text{(time)} \ \forall \text{(witness)} \]

Result (QS)

(2,3,0,0,0,1)  Evidential > Temporal

A.1.8.1.2 Pair-List Reading

\[ \rightarrow \text{An welchem Tag hat er gemäß jedem Zeugen Schmuck gestohlen?} \]

Gemäß welchem Zeugen hat er an jedem Tag Schmuck gestohlen?

Result (PLR)

Evidential > Temporal

A.1.8.1.3 Informational Focus

\[ \text{Er hat gemäß Frau Schmidt am Donnerstag gearbeitet.} \]

\[ \text{He has according to Mrs. Schmidt on Thursday worked} \]

'According to Mrs. Schmidt he worked on Thursday.'

Gemäß wem hat er am Donnerstag gearbeitet?
Er hat am Donnerstag gemäß Frau Schmidt gearbeitet.
Er hat gemäß Frau Schmidt am Donnerstag gearbeitet.

\[ \text{Wann hat er gemäß Frau Schmidt gearbeitet?} \]

\[ \text{Er hat gemäß Frau Schmidt am Donnerstag gearbeitet.} \]

? \[ \text{Er hat am Donnerstag gemäß Frau Schmidt gearbeitet.} \]

Result (IF)

(1,0)  Evidential > Temporal

A.1.8.2 Evidential – Benefactive

A.1.8.2.1 Quantifier Scope

\[ \text{Thomas hat gemäß mindestens eines Zeugen für jeden Verlag geschrieben.} \]

\[ \text{Thomas has according to at least one witness for every publishing house written} \]

'According to at least one witness, Thomas worked for every publishing house.'
Thomas hat gemäß mindestens eines Zeugen für jeden Verlag geschrieben.
\[ \exists \text{ (witness)} \forall \text{ (beneficiary)} \]
?? \[ \forall \text{ (beneficiary)} \exists \text{ (witness)} \]

Thomas hat für mindestens einen Verlag gemäß jedes Zeugens geschrieben.
\[ \exists \text{ (beneficiary)} \forall \text{ (witness)} \]
\[ \forall \text{ (witness)} \exists \text{ (beneficiary)} \]

Thomas hat für jeden Verlag gemäß mindestens eines Zeugen geschrieben.
\[ \forall \text{ (beneficiary)} \exists \text{ (witness)} \]
\[ \exists \text{ (witness)} \forall \text{ (beneficiary)} \]

Thomas hat gemäß jedes Zeugens für mindestens einen Verlag geschrieben.
\[ \forall \text{ (witness)} \exists \text{ (beneficiary)} \]
\[ * \exists \text{ (beneficiary)} \forall \text{ (witness)} \]

Result (QS)

(1,3,0,0,1,1) Evidential > Benefactive

A.1.8.2.2 Pair-List Reading

Gemäß welchem Zeugen hat er für jeden Verlag gearbeitet?

→ Für welchen Verlag hat er gemäß jedem Zeugen gearbeitet?

Result (PLR)

Evidential > Benefactive

A.1.8.2.3 Informational Focus

Thomas hat gemäß Herrn Maier für den Suhrkamp Verlag geschrieben.
Thomas has according to Mr. Maier for the Suhrkamp Verlag written
'According to Mr. Maier Thomas wrote for Suhrkamp Verlag (German publishing house).'

Für wen hat Thomas gemäß Herrn Maier geschrieben?
Thomas hat gemäß Herrn Maier für den Suhrkamp Verlag geschrieben.
* Thomas hat für den Suhrkamp Verlag gemäß Herrn Maier geschrieben.

Gemäß wem hat Thomas für den Suhrkamp Verlag geschrieben?
Er hat gemäß Herrn Maier für den Suhrkamp Verlag geschrieben.
Er hat für den Suhrkamp Verlag gemäß Herrn Maier geschrieben.

Result (IF)

(3,1) Evidential > Benefactive
A.1.8.3 Evidential – Reason

A.1.8.3.1 Quantifier Scope

Er hatte gemäß mindestens eines Zeugens wegen jedem Zahn gelitten.
He has according to at least one witness because of every tooth suffered
'He suffered because of every tooth according to at least one witness.'

Er hatte gemäß mindestens eines Zeugens wegen jedem Zahn gelitten.
∃ (witness) ∀ (reason)

? ∀ (reason) ∃ (witness)

? Er hatte wegen mindestens eines Zahnes gemäß jedes Zeugens gelitten.
∃ (reason) ∀ (witness)
∀ (witness) ∃ (reason)

Er hatte wegen jedem Zahn gemäß mindestens eines Zeugens gelitten.
∀ (reason) ∃ (witness)
∃ (witness) ∀ (reason)

Er hatte gemäß jedes Zeugens wegen mindestens eines Zahnes gelitten.
∀ (witness) ∃ (reason)

* ∃ (reason) ∀ (witness)

Nachfeld

? Er hatte gemäß mindestens eines Zeugens gelitten wegen jedem Zahn.
∃ (witness) ∀ (reason)

* ∀ (reason) ∃ (witness)

Er hatte wegen mindestens eines Zahnes gelitten gemäß jedes Zeugens.
?? ∃ (reason) ∀ (witness)
∀ (witness) ∃ (reason)

Er hatte wegen jedem Zahn gelitten gemäß mindestens eines Zeugens.
* ∀ (reason) ∃ (witness)
∃ (witness) ∀ (reason)

Er hatte gemäß jedes Zeugens gelitten wegen mindestens eines Zahnes.
∀ (witness) ∃ (reason)

?? ∃ (reason) ∀ (witness)

Result (QS)

(1,3,0,0,0,1) +1 Evidential > Reason
A.1.8.3.2 Pair-List Reading

Gemäß welchem Zeugen litt er wegen jedem Zahn?

→ Wegen welchem Zahn litt er gemäß jedem Zeugen?

Result (PLR)

Evidential > Reason

A.1.8.3.3 Informational Focus

Hans hat gemäß Brigitte wegen Zahnschmerzen geschrieen.
Hans has according to Brigitte because of toothache cried
'According to Brigitte, Hans cried because of toothache.'

Gemäß wem hat Hans wegen Zahnschmerzen geschrieen?
Er hat gemäß Brigitte wegen Zahnschmerzen geschrieen.
Er hat wegen Zahnschmerzen gemäß Brigitte geschrieen.

Warum hat Hans gemäß Brigitte geschrieen?
Er hat gemäß Brigitte wegen Zahnschmerzen geschrieen.
?? Er hat wegen Zahnschmerzen gemäß Brigitte geschrieen.

Result (IF)

(2,1) Evidential > Reason

A.1.8.4 Evidential – Locative

A.1.8.4.1 Quantifier Scope

Er hat gemäß mindestens eines Zeugen in jedem Zimmer Schmuck gestohlen.
He has according to at least one witness in every room jewellery stolen
'According to at least one witness, he stole jewellery in every room.'

Er hat gemäß mindestens eines Zeugen in jedem Zimmer Schmuck gestohlen.
∃ (witness)∀ (place)

? ∀ (place) ∃ (witness)

Er hat in mindestens einem Zimmer gemäß jedes Zeugens Schmuck gestohlen.
∃ (place)∀ (witness)
∀ (witness)∃ (place)

Er hat in jedem Zimmer gemäß mindestens eines Zeugen Schmuck gestohlen.
∀ (place) ∃ (witness)
∃ (witness)∀ (place)

Er hat gemäß jedes Zeugens in mindestens einem Zimmer Schmuck gestohlen.
∀ (witness) ∃ (place)
? ∃ (place)∀ (witness)
A.1.8.4.2 Pair-List Reading

Gemäß welchem Zeugen stahl er in jedem Zimmer Schmuck?

→ In welchem Zimmer stahl er gemäß jedem Zeugen Schmuck?

Result (PLR)

Evidential > Locative

A.1.8.4.3 Informational Focus

Er hat gemäß Frau Schmidt in Salzburg gearbeitet.
He has according to Mrs. Schmidt in Salzburg worked
'According to Mrs. Schmidt he worked in Salzburg.'

Gemäß wem hat er in Salzburg gearbeitet?
Er hat gemäß Frau Schmidt in Salzburg gearbeitet.
Er hat in Salzburg gemäß Frau Schmidt gearbeitet.

Wo hat er gemäß Frau Schmidt gearbeitet?
Er hat gemäß Frau Schmidt in Salzburg gearbeitet.
?
Er hat in Salzburg gemäß Frau Schmidt gearbeitet.

Result (IF)

(1,0) Evidential > Locative

A.1.8.5 Evidential – Instrumental

A.1.8.5.1 Quantifier Scope

Er hat gemäß mindestens eines Zeugens mit jeder Pistole geschossen.
He has according to at least one witness with every gun shot
'According to at least one witness, he shot with every gun.'

Er hat gemäß mindestens eines Zeugens mit jeder Pistole geschossen.
∃ (witness) ∀ (instrument)

? ∀ (instrument) ∃ (witness)

Er hat mit mindestens einer Pistole gemäß jedes Zeugen geschossen.
∃ (instrument) ∀ (witness)
∀ (witness) ∃ (instrument)

Er hat mit jeder Pistole gemäß mindestens eines Zeugens geschossen.
∀ (instrument) ∃ (witness)
∃ (witness) ∀ (instrument)
Er hat gemäß jedes Zeugen mit mindestens einer Pistole geschossen.

∀ (witness) ∃ (instrument)

* ∃ (instrument) ∀ (witness)

**Result (QS)**

(1,3,0,0,1,0)  Evidential > Instrumental

**A.1.8.5.2 Pair-List Reading**

Gemäß welchem Zeugen schoss er mit jeder Pistole?

→ Mit welcher Pistole schoss er gemäß jedem Zeugen?

**Result (PLR)**

Evidential > Instrumental

**A.1.8.5.3 Informational Focus**

Er hat gemäß Herrn Schmidt mit einer Pistole geschossen.

He has according to Mr. Schmidt with a gun shot

'According to Mr Schmidt, he shot with a gun.'

Gemäß wem hat er mit einer Pistole geschossen?

**Er hat gemäß Herrn Schmidt mit einer Pistole geschossen.**

Er hat mit einer Pistole gemäß Herrn Schmidt geschossen.

Mit was hat er gemäß Herrn Schmidt geschossen?

Er hat gemäß Herrn Schmidt mit einer Pistole geschossen.

* Er hat mit einer Pistole gemäß Herrn Schmidt geschossen.

**Result (IF)**

(3,1)  Evidential > Instrumental

**A.1.8.6 Evidential – Manner**

**A.1.8.6.1 Quantifier Scope**

Er hat gemäß mindestens eines Zeugen auf jede Art gezeichnet.

He has according to at least one witness in every way painted

'According to at least one witness, he painted in every way.'

Er hat gemäß mindestens eines Zeugens auf jede Art gezeichnet.

∃ (witness) ∀ (manner)

* ∀ (manner) ∃ (witness)

Er hat auf mindestens eine Art gemäß jedes Zeugens gezeichnet.

∃ (manner) ∀ (witness)

∀ (witness) ∃ (manner)
Er hat auf jede Art gemäß mindestens eines Zeugens gezeichnet.
∀ (manner) ∃ (witness)
∃ (witness) ∀ (manner)

Er hat gemäß jedes Zeugens auf mindestens eine Art gezeichnet.
∀ (witness) ∃ (manner)
* ∃ (manner) ∀ (witness)

Result (QS)

(3,3,0,0,1,1)  Evidential > Manner

A.1.8.6.2 Pair-List Reading

Gemäß welchem Zeugen malte er auf jede Art?

→ Auf welche Art malte er gemäß jedem Zeugen?

Result (PLR)

Evidential > Manner

A.1.8.6.3 Informational Focus

Er hat gemäß Barbara auf seine ganz spezielle Art gezeichnet.  
He has according to Barbara in his very special kind drawn  
'According to Barbara, he drew in his own special kind.'

Gemäß wem hat Thomas auf seine ganz spezielle Art gezeichnet?

Er hat gemäß Barbara auf seine ganz spezielle Art gezeichnet.  
Er hat auf seine ganz spezielle Art gemäß Barbara gezeichnet.

Wie hat Thomas gemäß Barbara gezeichnet?

Er hat gemäß Barbara auf seine ganz spezielle Art gezeichnet.  
* Er auf seine ganz spezielle Art gemäß Barbara gezeichnet.

Result (IF)

(3,1)  Evidential > Manner

A.1.8.7 Evidential – Comitative

A.1.8.7.1 Quantifier Scope

Katrin hat gemäß mindestens eines Kritikers mit jedem französischen Regisseur gearbeitet.  
Katrin hat according to at least one critic with every French director worked  
'According to at least one critic, Katrin worked with every French director.'

Katrin hat gemäß mindestens eines Kritikers mit jedem französischen Regisseur gearbeitet.  
∃ (witness) ∀ (comitative)  
* ∀ (comitative) ∃ (witness)
Katrin hat mit mindestens einem französischen Regisseur gemäß jedes Kritikers gearbeitet.
\[ \exists \text{ (comitative)} \forall \text{ (witness)} \]
\[ \forall \text{ (witness)} \exists \text{ (comitative)} \]

Katrin hat mit jedem französischen Regisseur gemäß mindestens eines Kritikers gearbeitet.
\[ \exists \text{ (witness)} \forall \text{ (comitative)} \]
\[ \forall \text{ (comitative)} \exists \text{ (witness)} \]

Katrin hat gemäß jedes Kritikers mit mindestens einem französischen Regisseur gearbeitet.
\[ \forall \text{ (witness)} \exists \text{ (comitative)} \]
\[ \ast \exists \text{ (comitative)} \forall \text{ (witness)} \]

Result (QS)

(3,3,0,0,0,1) Evidential > Comitative

A.1.8.7.2 Pair-List Reading

→ Mit welchem Regisseur arbeitete sie gemäß jedem Kritiker?

Gemäß welchem Kritiker arbeitete sie mit jedem Regisseur?

Result (PLR)

Evidential > Comitative

A.1.8.7.3 Informational Focus

Katrin hat gemäß Bruno mit Schlöndorf gearbeitet.
Katrin has according to Bruno with Schlöndorf worked
'Katrin worked with Schlöndorf (German director) according to Bruno.'

Gemäß wem hat Katrin mit Schlöndorf gearbeitet?
Sie hat gemäß Bruno mit Schlöndorf gearbeitet.
?
Sie hat mit Schlöndorf gemäß Bruno gearbeitet.

Mit wem hat Katrin gemäß Bruno gearbeitet?
Katrin hat gemäß Bruno mit Schlöndorf gearbeitet.
?
Katrin hat mit Schlöndorf gemäß Bruno gearbeitet.

Result (IF)

Strangely, I have problems with the focussed element in second position, when it is evidential, but in first position both are good. But still I have a preference for having

(1,1) Evidential > Comitative
A.1.9 Matter

A.1.9.1 Matter - Temporal

A.1.9.1.1 Quantifier Scope

Er hat an mindestens einem Tag über jede romanische Sprache gesprochen.
He has on at least one day about every Romance language talked
'He talked about every Romance language on at least one day.'

Er hat an mindestens einem Tag über jede romanische Sprache gesprochen.
∃ (time) ∀ (matter)
?
∀ (matter) ∃ (time)

Er hat über mindestens eine romanische Sprache an jedem Tag gesprochen.
∃ (matter) ∀ (time)
∀ (time) ∃ (matter)

Er hat über jede romanische Sprache an mindestens einem Tag gesprochen.
∀ (matter) ∃ (time)
∃ (time) ∀ (matter)

Er hat an jedem Tag über mindestens eine romanische Sprache gesprochen.
∀ (time) ∃ (matter)
*
∃ (matter) ∀ (time)

Result (QS)

(1,3,0,0,1,0) Temporal > Matter

A.1.9.1.2 Pair-List Reading

An welchem Tag hat er über jede Sprache gesprochen?
→ Über welche Sprache hat er an jedem Tag gesprochen?

Result (PLR)

Temporal > Matter

A.1.9.1.3 Informational Focus

Professor Müller sprach am Mittwoch über Anhebungsphänomene.
Professor Müller spoke about Raising phenomena on Wednesday.

Wann sprach Prof. Müller über Anhebungsphänomene?
Er sprach am Mittwoch über Anhebungsphänomene.
Er sprach über Anhebungsphänomene am Mittwoch.
Über was sprach Prof. Müller am Mittwoch?
Er sprach am Mittwoch über Anhebungsphänomen.
* Er sprach über Anhebungsphänomene am Mittwoch.

Result (IF)

(3,1) Temporal > Matter

A.1.9.2 Matter - Benefactive

A.1.9.2.1 Quantifier Scope

Er hat für mindestens einen Zuhörer über jeden italienischen Dialekt gesprochen.
He has for at least one listener about every Italian dialect talked
'He talked for at least one listener about every Italian dialect.'

Er hat für mindestens einen Zuhörer über jeden italienischen Dialekt gesprochen.
∃ (beneficiary) ∀ (matter)

? ∀ (matter) ∃ (beneficiary)

Er hat über mindestens einen italienischen Dialekt für jeden Zuhörer gesprochen.
∃ (matter) ∀ (beneficiary)

∀ (beneficiary) ∃ (matter)

Er hat über jeden italienischen Dialekt für mindestens einen Zuhörer gesprochen.
∀ (matter) ∃ (beneficiary)

∃ (beneficiary) ∀ (matter)

Er hat für jeden Zuhörer über mindestens einen italienischen Dialekt gesprochen.
∀ (beneficiary) ∃ (matter)

?∀ (matter) ∀ (beneficiary)

Result (QS)

(1,2,0,0,0,0) Benefactive > Matter

A.1.9.2.2 Pair-List Reading

→ Über welchen Dialekt hat er für jeden Zuhörer gesprochen?

Für welchen Zuhörer hat er über jeden Dialekt gesprochen?

Result (PLR)

Benefactive > Matter

A.1.9.2.3 Informational Focus

Herr Müller-Thurgau hat für Frau Sylvaner über die Bedeutung des Weinbaus gesprochen.
Mr. Müller-Thurgau has for Mrs. Sylvaner about the importance of wine growing spoken
'Mr. Müller-Thurgau spoke about the importance of wine growing for Mrs. Sylvaner.'
Für wen hat Herr Müller-Thurgau über die Bedeutung des Weinbaus gesprochen? 

Er hat für Frau Sylvaner über die Bedeutung des Weinbaus gesprochen. Er hat über die Bedeutung des Weinbaus für Frau Sylvaner gesprochen.

Über was hat Herr Müller-Thurgau für Frau Sylvaner gesprochen? Er hat für Frau Sylvaner über die Bedeutung des Weinbaus gesprochen. ?? Er hat über die Bedeutung des Weinbaus für Frau Sylvaner gesprochen.

Result (IF)

(2,1) Benefactive > Matter

A.1.9.3 Matter - Reason

A.1.9.3.1 Quantifier Scope

Der Anwalt hat über mindestens einen Anklagepunkt wegen jedem Antrag geredet.

∀ (reason) ∃ (matter)
∃ (matter) ∀ (reason)

Der Anwalt hat wegen mindestens einem Antrag über jeden Anklagepunkt geredet.

∃ (reason) ∀ (matter)
?? ∀ (matter) ∃ (reason)

Der Anwalt hat wegen jedem Antrag über mindestens einen Anklagepunkt geredet.

∀ (reason) ∃ (matter)
* ∃ (matter) ∀ (reason)

Der Anwalt hat über jeden Anklagepunkt wegen mindestens einem Antrag geredet.

∀ (matter) ∃ (reason)
∃ (reason)∀ (matter)

Result (QS)

(2,3,0,0,1,1) Reason > Matter

A.1.9.3.2 Pair-List Reading

→ Über welchen Anklagepunkt hat er wegen jedem Antrag geredet?

Wegen welchen Antrag hat er über jeden Anklagepunkt geredet?

Result (PLR)

Reason > Matter
A.1.9.3.3 Informational Focus

Hans referierte wegen seines Auslandsaufenthaltes über die italienische Sprache. 'Hans talked about Italian language because of his stay abroad.'

Warum referierte Hans über die italienische Sprache?
Er referierte über die italienische Sprache wegen seines Auslandsaufenthaltes.
Er referierte wegen seines Auslandsaufenthaltes über die italienische Sprache.

Worüber referierte Hans wegen seines Auslandsaufenthaltes?
Er referierte wegen seines Auslandsaufenthaltes über die italienische Sprache.
Er referierte über die italienische Sprache wegen seines Auslandsaufenthaltes.

Result (IF)

(1,1) Reason > Matter

A.1.9.4 Matter - Locative

A.1.9.4.1 Quantifier Scope

Herr Lüdenscheidt hat in mindestens einer Stadt über jede romanische Sprache gesprochen.
Mr. Lüdenscheidt has in at least one city about every Romance language talked
'Mr. Lüdenscheidt talked about every Romance language in at least one city.'

Herr Lüdenscheidt hat in mindestens einer Stadt über jede romanische Sprache gesprochen.
∃ (place) ∀ (matter)  
? ∀ (matter) ∃ (place)

Herr Lüdenscheidt hat über mindestens eine romanische Sprache in jeder Stadt gesprochen.
∃ (matter) ∀ (place)  
∀ (place) ∃ (matter)

Herr Lüdenscheidt hat über jede romanische Sprache in mindestens einer Stadt gesprochen.
∀ (matter) ∃ (place)  
∃ (place) ∀ (matter)

Herr Lüdenscheidt hat in jeder Stadt über mindestens eine romanische Sprache gesprochen.
∀ (place) ∃ (matter)  
* ∃ (matter) ∀ (place)

Result (QS)

(1,3,0,0,0,0) Locative > Matter

A.1.9.4.2 Pair-List Reading

In welcher romanische Stadt redete er über jeder romanische Sprache?

→ Über welche romanische Sprache redete er in jeder Stadt?
Result (PLR)

Locative > Matter

A.1.9.4.3 Informational Focus

Herr Müller-Lüdenscheidt hat in Moskau über neue Mafiamethoden gesprochen.
Mr. Müller-Lüdenscheidt has in Moscow about new mafia methods spoken
'Mr. Müller-Lüdenscheidt talked about new mafia methods in Moscow.'

Über was hat Herr Müller-Lüdenscheidt in Moskau gesprochen?
Er hat in Moskau über neue Mafiamethoden gesprochen.
?? Er hat über neue Mafiamethoden in Moskau gesprochen.

Wo hat Herr Müller-Lüdenscheidt über neue Mafiamethoden gesprochen?
Er hat in Moskau über neue Mafiamethoden gesprochen.
Er hat über neue Mafiamethoden in Moskau gesprochen.

Result (IF)

(2,1) Locative > Matter

A.1.9.5 Matter - Instrumental

A.1.9.5.1 Quantifier Scope
The teacher asked the pupils to use video, overhead and hand outs for their presentations.

Hans hat mit mindestens einem Means über jedes Thema referiert.
Hans has with at least one Means about every matter talked (given a lecture)
'Hans talked with at least one Means about every matter.'

Hans hat mit mindestens einem Means über jedes Thema referiert.
∃ (instrument) ∀ (matter)

?? ∀ (matter) ∃ (instrument)

Hans hat über mindestens ein Thema mit jedem Means referiert.
∃ (matter) ∀ (instrument)
∀ (instrument) ∃ (matter)

Hans hat über jedes Thema mit mindestens einem Means referiert.
∀ (matter) ∃ (instrument)
∃ (instrument) ∀ (matter)

Hans hat mit jedem Means über mindestens ein Thema referiert.
∀ (instrument) ∃ (matter)

?? ∃ (matter) ∀ (instrument)

Result (QS)

(1,1,0,0,0,0) Instrumental > Matter
A.1.9.5.2 Pair-List Reading

Mit welchem Means referierte Hans über jedes Thema?

→ Über welches Thema referierte Hans mit jedem Means?

Result (PLR)

Instrumental > Matter

A.1.9.5.3 Informational Focus

Hans hat mit der Powerpoint – Präsentation über indonesische Sprachen referiert.
Hans has with the powerpoint presentation about Indonesian languages talked
'Hans talked about Indonesian languages with the powerpoint presentation.'

Über was hat Hans mit der Powerpoint - Präsentation referiert?
?
Er hat über indonesische Sprachen mit der Powerpoint – Präsentation referiert.
Er hat mit der Powerpoint – Präsentation über indonesische Sprachen referiert.

Mit was hat Hans über indonesische Sprachen referiert?
Er hat mit der Powerpoint – Präsentation über indonesische Sprachen referiert.
Er hat über indonesische Sprache mit der Powerpoint - Präsentation referiert.

Result (IF)

(1,0) Instrumental > Matter

A.1.9.6 Matter - Manner

A.1.9.6.1 Quantifier Scope

Er hat über mindestens eine Sprache auf jede Art referiert.
He has about at least one language in every way talked
'He talked in every way about at least one language.'

Er hat über mindestens eine Sprache auf jede Art referiert.
∃ (matter) ∀ (manner)
?
∀ (manner) ∃ (matter)

Er hat auf mindestens eine Art über jede Sprache referiert.
∃ (manner) ∀ (matter)
∀ (matter) ∃ (manner)

Er hat auf jede Art über mindestens eine Sprache referiert.
∀ (manner) ∃ (matter)
∃ (matter) ∀ (manner)

Er hat über jede Sprache auf mindestens eine Art referiert.
∀ (matter) ∃ (manner)
?? ∃ (manner) ∀ (matter)
Result (QS)

(1,2,0,0,0,0)  Matter > Manner

A.1.9.6.2 Pair-List Reading

→ Auf welche Art referierte er über jede Sprache?
   Über welche Sprache referierte er auf jede Art?

Result (PLR)

Matter > Manner

A.1.9.6.3 Informational Focus

Er hat über Thailändisch auf seine ganz besondere Art referiert.
He has about Thailandic in his very special way talked
He talked about Thailandic in his very special way.

Wie hat er über Thailändisch referiert?
Er hat über Thailändisch auf seine ganz besondere Art referiert.
? Er hat auf seine ganz besondere Art über Thailändisch referiert.

Über was hat er auf seine ganz besondere Art referiert?
Er hat über Thailändisch auf seine ganz besondere Art referiert.
Er hat auf seine ganz besondere Art über Thailändisch referiert.

Result (IF)

(1,0)  Matter > Manner

A.1.9.7 Matter - Comitative

A.1.9.7.1 Quantifier Scope

Hans hat mit mindestens einem Kollegen über jede uralische Sprache geschrieben.
Hans has with at least one colleague about every Uralic language written
'Hans wrote about every Uralic language with at least one colleague.'

Hans hat mit mindestens einem Kollegen über jede uralische Sprache geschrieben.
∃ (comitative) ∀ (matter)
∀ (matter) ∃ (comitative)

Hans hat über mindestens eine uralische Sprache mit jedem Kollegen geschrieben.
∃ (matter) ∀ (comitative)
? ∀ (comitative) ∃ (matter)

Hans hat über jede uralische Sprache mit mindestens einem Kollegen geschrieben.
∀ (matter) ∃ (comitative)
∃ (comitative) ∀ (matter)
Hans hat mit jedem Kollegen über mindestens eine uralische Sprache geschrieben.
\[ \forall \text{ (comitative)} \exists \text{ (matter)} \]
\[ \exists \text{ (matter)} \forall \text{ (comitative)} \]

Hans hat mehr als einem Kollegen über fast jede uralische Sprache geschrieben.
\[ M \text{ (comitative)} F \text{ (matter)} \]
\[ F \text{ (matter)} M \text{ (comitative)} \]

Hans hat über mehr als eine uralische Sprache mit fast jedem Kollegen geschrieben.
\[ M \text{ (matter)} F \text{ (comitative)} \]
\[ F \text{ (comitative)} M \text{ (matter)} \]

Result (QS)
(1,1,0,0,0,0) Comitative > Matter

A.1.9.7.2 Pair-List Reading

Mit welchem Kollegen schrieb Hans über jede uralische Sprache?
→ Über welche uralische Sprache schrieb Hans mit jedem Kollegen?

Result (PLR)
Comitative > Matter

A.1.9.7.3 Informational Focus

Hans schrieb mit Brigitte über das Ungarische.
'Hans wrote with Brigitte about Hungarian.'

Mit wem schrieb Hans über das Ungarische?
**Hans schrieb mit Brigitte über das Ungarische.**
Hans schrieb über das Ungarische mit Brigitte.

Über was schrieb Hans mit Brigitte?
Hans schrieb mit Brigitte über das Ungarische.
* Hans schrieb über das Ungarische mit Brigitte.

Result (IF)
(3,1) Comitative > Matter

A.1.9.8 Matter - Evidential

A.1.9.8.1 Quantifier Scope

Er hat gemäß mindestens eines Zeugens über jeden deutschen Dialekt gesprochen.
He has according to at least one witness about every German dialect talked
'According to at least one witness, he talked about every German dialect.'
Er hat gemäß mindestens eines Zeugens über jeden deutschen Dialekt gesprochen.
∃ (witness) ∀ (matter)
? ∀ (matter) ∃ (witness)

Er hat über mindestens einen deutschen Dialekt gemäß jedes Zeugens gesprochen.
∃ (matter) ∀ (witness)
∀ (witness) ∃ (matter)

Er hat über jeden deutschen Dialekt gemäß mindestens eines Zeugens gesprochen.
∀ (matter) ∃ (witness)
∃ (witness) ∀ (matter)

Er hat gemäß jedes Zeugens über mindestens einen deutschen Dialekt gesprochen.
∀ (witness) ∃ (matter)
?? ∃ (matter) ∀ (witness)

Result (QS)

(1,2,0,0,1,1) Evidential > Matter

A.1.9.8.2 Pair-List Reading

Gemäß welchem Zeugen sprach er über jeden deutschen Dialekt?

→ Über welchen deutschen Dialekt sprach er gemäß jedem Zeugen?

Result (PLR)

Evidential > Matter

A.1.9.8.3 Informational Focus

Hermann sprach gemäß Frau Schmidt über Katzenhygiene.
'Herman spoke according to Mrs. Schmidt about cat hygiene.'

Gemäß wem sprach Hermann über Katzenhygiene?
Er sprach gemäß Frau Schmidt über Katzenhygiene.
Er sprach über Katzenhygiene gemäß Frau Schmidt.

Über was sprach Hermann gemäß Frau Schmidt?
Er sprach gemäß Frau Schmidt über Katzenhygiene.
?? Er sprach über Katzenhygiene gemäß Frau Schmidt.

Result (IF)

(2,1) Evidential > Matter.
A.1.10 Goal

In German, it is possible to add the addressee of a letter and the direction of the letter as modifiers of the verb "schreiben" (to write).

A.1.10.1 Goal – Temporal

A.1.10.1.1 Quantifier Scope

Michael was travelling between Madrid, Paris and London. His girl friend, Barbara, used to write him regularly letters.

Barbara hat ihm in mindestens einer Woche in jede Stadt geschrieben.
Barbara has him in at least one week into every town written
'At least in one week, Barbara wrote letters to him, sending them to every town.'

Barbara hat ihm in mindestens einer Woche in jede Stadt geschrieben.
∃ (time) ∀ (goal)
? ∀ (goal) ∃ (time)

Barbara hat ihm in mindestens eine Stadt in jeder Woche geschrieben.
∃ (goal) ∀ (time)
∀ (time) ∃ (goal)

Barbara hat ihm in jede Stadt in mindestens einer Woche geschrieben.
∀ (goal) ∃ (time)
∃ (time) ∀ (goal)

Barbara hat ihm in jeder Woche in mindestens eine Stadt geschrieben.
∀ (time) ∃ (goal)
* ∃ (goal) ∀ (time)

Result (QS)

(1,3,0,0,1,0) Temporal > Goal

A.1.10.1.2 Pair-List Reading

→ In welche Stadt hat Barbara ihm in jeder Woche geschrieben?

In welcher Woche hat Barbara ihm in jede Stadt geschrieben?

Result (PLR)

Temporal > Goal

A.1.10.1.3 Informational Focus

Barbara hat ihm am Dienstag nach Madrid geschrieben.
Barbara has him on Tuesday to Madrid written
Barbara wrote a letter to him on Tuesday, while he was in Madrid.
Wohin hat Barbara ihm am Dienstag geschrieben?
Sie hat ihm am Dienstag nach Madrid geschrieben.
?? Sie hat ihm nach Madrid am Dienstag geschrieben.

Wann hat Barbara ihm nach Madrid geschrieben?
Sie hat ihm am Dienstag nach Madrid geschrieben.
Sie hat ihm nach Madrid am Dienstag geschrieben.

Result (IF)

(2,1) Temporal > Goal

A.1.10.2 Goal – Benefactive

A.1.10.2.1 Quantifier Scope
Sophie was the secretary of Mr. Maier, of Mr. Mayer and Mr. Mair, who all wanted to keep contact with Michael. So they ordered her regularly to write letters to him, wherever he was.

Sophie hat ihm für mindestens einen Chef in jede Stadt geschrieben.
Sophie has him for at least one boss into every town written
' Ordered by at least one boss, Sophie wrote a letter into every town.'

Sophie hat ihm für mindestens einen Chef in jede Stadt geschrieben.
∃ (beneficiary) ∀ (goal)
?
∀ (goal) ∃ (beneficiary)

Sophie hat ihm in mindestens eine Stadt für jeden Chef geschrieben.
∃ (goal) ∀ (beneficiary)
∀ (beneficiary) ∃ (goal)

Sophie hat ihm in jede Stadt für mindestens einen Chef geschrieben.
∀ (goal) ∃ (beneficiary)
∃ (beneficiary) ∀ (goal)

Sophie hat ihm für jeden Chef in mindestens eine Stadt geschrieben.
∀ (beneficiary) ∃ (goal)
?
∃ (goal) ∀ (beneficiary)

Result (QS)

(1,1,0,0,0,0) Benefactive > Goal

A.1.10.2.2 Pair-List Reading

Für welchen Chef hat Sophie ihm in jede Stadt geschrieben?

→ In welche Stadt hat Sophie ihm für jeden Chef geschrieben?

Result (PLR)

Benefactive > Goal
A.1.10.2.3 Informational Focus

Sophie hat ihm für Herrn Mair nach Madrid geschrieben.
Sophie has him for Mr. Mair to Madrid written
'Sophie wrote a letter to him for Mr. Mair, sending it to Madrid.'

Wohin hat ihm Sophie für Herrn Mair geschrieben?
Sie hat ihm für Herrn Mair nach Madrid geschrieben.
? Sie hat ihm nach Madrid für Herrn Mair geschrieben.

Für wen hat ihm Sophie nach Madrid geschrieben?
Sie hat ihm für Herrn Mair nach Madrid geschrieben.
Sie hat ihm nach Madrid für Herrn Mair geschrieben.

Result (IF)

(1,0) Benefactive > Goal

A.1.10.3 Goal – Reason

A.1.10.3.1 Quantifier Scope

While Michael was travelling around he also was responsible for several jobs in his company. Sophie, the secretary, mailed him whenever a task needed a decision from him.

Sophie hat ihm wegen mindestens einem Auftrag in jede Stadt geschrieben.
Sophie has him because of at least one job in every town written.
'Sophie wrote letters to him because of at least one job, sending them into every town.

Sophie hat ihm wegen mindestens einem Auftrag in jede Stadt geschrieben.
∃ (reason) ∀ (goal)
∀ (goal) ∃ (reason)

Sophie hat ihm in mindestens eine Stadt wegen jedem Auftrag geschrieben.
∃ (goal) ∀ (reason)
? ∀ (reason) ∃ (goal)

Sophie hat ihm in jede Stadt wegen mindestens einem Auftrag geschrieben.
∀ (goal) ∃ (reason)
∃ (reason) ∀ (goal)

Sophie hat ihm wegen jedem Auftrag in mindestens eine Stadt geschrieben.
∀ (reason) ∃ (goal)
∃ (goal) ∀ (reason)

Nachfeld

Sophie hat ihm wegen mindestens einem Auftrag geschrieben in jede Stadt.
∃ (reason) ∀ (goal)
?? ∀ (goal) ∃ (reason)
Sophie hat ihm in mindestens eine Stadt geschrieben wegen jedem Auftrag.

?? ∃ (goal) ∀ (reason)
∀ (reason) ∃ (goal)

Sophie hat ihm in jede Stadt geschrieben wegen mindestens einem Auftrag.

* ∀ (goal) ∃ (reason)
∃ (reason) ∀ (goal)

Sophie hat ihm wegen jedem Auftrag geschrieben in mindestens eine Stadt.

∀ (reason) ∃ (goal)
∃ (goal) ∀ (reason)

Result (QS)

(1,0,0,0,0,0) + 1 Reason > Goal2

A.1.10.3.2 Pair-List Reading

Wegen welchem Auftrag hat Sophie ihm in jede Stadt geschrieben?

→ In welche Stadt hat Sophie ihm wegen jedem Auftrag geschrieben?

Result (PLR)

Reason > Goal

A.1.10.3.3 Informational Focus

Sophie hat ihm wegen der Helsinki-Sache nach Paris geschrieben.
Sophie has him because of the Helsinki job to Paris written.
'Sophie wrote letters to him because of the Helsinki job, sending them to Paris.'

Warum hat Sophie ihm nach Paris geschrieben?
Sie hat ihm wegen der Helsinki-Sache nach Paris geschrieben.
Sie hat ihm nach Paris wegen der Helsinki-Sache geschrieben.

Wohin hat Sophie ihm wegen der Helsinki-Sache geschrieben?
Sie hat ihm wegen der Helsinki-Sache nach Paris geschrieben.
? Sie hat ihm nach Paris wegen der Helsinki-Sache geschrieben.

Result (IF)

(1,0) Reason > Goal
A.1.10.4 Goal – Locative

A.1.10.4.1 Quantifier Scope
Sophie worked in the morning in the office of Mr. Mayer, in the afternoon in the office of Mr. Maier and sometimes on the weekend in the office of Mr. Mair. In every of the offices she used to write the letters to Michael, which she sent to the different cities he was in.

Sophie hat ihm in mindestens einem Büro in jede Stadt geschrieben.
Sophie has him in at least one office in(to) every city written.
'Sophie wrote letters to him in at least one office, sending them into every city.'

Sophie hat ihm in mindestens einem Büro in jede Stadt geschrieben.
∃ (place) ∀ (goal)
? ∀ (goal) ∃ (place)

Sophie hat ihm in mindestens einer Stadt in jedem Büro geschrieben.
∃ (goal) ∀ (place)
∀ (place) ∃ (goal)

Sophie hat ihm in jede Stadt in mindestens einem Büro geschrieben.
∀ (goal) ∃ (place)
∃ (place) ∀ (goal)

Sophie hat ihm in jedem Büro in mindestens eine Stadt geschrieben.
∀ (place) ∃ (goal)
* ∃ (goal) ∀ (place)

Result (QS)

\[(1,3,0,0,0,0) \quad \text{Locative} > \text{Goal}\]

A.1.10.4.2 Pair-List Reading

In welchem Büro hat Sophie ihm in jede Stadt geschrieben?

→ In welche Stadt hat Sophie ihm in jedem Büro geschrieben?

Result (PLR)

\[\text{Locative} > \text{Goal}\]

A.1.10.4.3 Informational Focus

Sophie hat Michael in ihrem Büro nach London geschrieben.
Sophie has Michael in her office to London written.
'Sophie wrote letters to Michael in her office, sending them to London.'

Sophie hat Michael in ihrem Büro nach London geschrieben.
Sophie has Michael in her office to London written.
Sophie wrote Micheal in her office to London.
Wo hat Sophie ihm nach London geschrieben?
Sie hat ihm in ihrem Büro nach London geschrieben.
Sie hat ihm nach London in ihrem Büro geschrieben.

Wohin hat Sophie ihm in ihrem Büro geschrieben?
Sie hat ihm in ihrem Büro nach London geschrieben.
?? Sie hat ihm nach London in ihrem Büro geschrieben.

Result (IF)

(2.1) Locative > Goal

A.1.10.5 Goal – Instrumental

A.1.10.5.1 Quantifier Scope

Sophie had a great collection of pencils that she used to write with.

Sophie hatte ihm mit mindestens einem Füller in jede Stadt geschrieben.
Sophie has him with at least one pencil into every town written.
'Sophie wrote letters to him with at least one pencil, sending them into every town.'

Sophie hat ihm mit mindestens einem Füller in jede Stadt geschrieben.
∃ (instrument) ∀ (goal)
∀ (goal) ∃ (instrument)

Sophie hat ihm in mindestens eine Stadt mit jedem Füller geschrieben.
∃ (goal) ∀ (instrument)
? ∀ (instrument) ∃ (goal)

Sophie hat ihm in jede Stadt mit mindestens einem Füller geschrieben.
∀ (goal) ∃ (instrument)
? ∃ (instrument) ∀ (goal)

Sophie hat ihm mit jedem Füller in mindestens eine Stadt geschrieben.
∀ (instrument) ∃ (goal)
∃ (goal) ∀ (instrument)

Result (QS)

(1,1,0,0,0,0) Goal > Instrumental

A.1.10.5.2 Pair-List Reading

→ Mit welchem Füller hat Sophie ihm in jede Stadt geschrieben?
In welche Stadt hat Sophie ihm mit jedem Füller geschrieben?

Result (PLR)

Goal > Instrumental
A.1.10.5.3  Informational Focus

Hans hat Sophie nach München mit dem roten Füller geschrieben.
Hans has Sophie to Munich with the red pen written.
'Hans wrote letters to Sophie with the red pen, sending them to Munich.

Wohin hat er ihr mit dem roten Füller geschrieben?
Er hat ihr nach München mit dem roten Füller geschrieben.
Er hat ihr mit dem roten Füller nach München geschrieben.

Mit was hat er ihr nach München geschrieben?
Er hat ihr nach München mit dem roten Füller geschrieben.
? Er hat ihr mit dem roten Füller nach München geschrieben.

Result (IF)

(1,0)  Goal > Instrumental

A.1.10.6  Goal – Manner

A.1.10.6.1  Quantifier Scope

Sophie's way of thinking of Michael was much affected by the moon, by her last meal and her monthly cycle. And this changing attitude towards him affected her way of writing to him. There were clearly three different kinds to be distinguished: the emotional "being in love" writing, the very objective, practical writing and the emotional "you egoistic macho man" writing.

Sophie hat ihm auf mindestens eine Art in jeder Stadt geschrieben.
Sophie has him in at least one manner into every city written
'Sophie wrote letters to him in a least one manner, sending them to every city.'

Sophie hat ihm auf mindestens eine Art in jeder Stadt geschrieben.
∃ (manner) ∀ (goal)
∀ (goal) ∃ (manner)

Sophie hat ihm in mindestens eine Stadt auf jede Art geschrieben.
∃ (goal) ∀ (manner)
? ∀ (manner) ∃ (goal)

Sophie hat ihm in jeder Stadt auf mindestens eine Art geschrieben.
∀ (goal) ∃ (manner)
? ∃ (manner) ∀ (goal)

Sophie hat ihm auf jede Art in mindestens eine Stadt geschrieben.
∀ (manner) ∃ (goal)
∃ (goal) ∀ (manner)

Result (QS)

(1,1,0,0,0,1)  Goal > Manner
A.1.10.6.2 Pair-List Reading

→ Auf welche Art hat Sophie ihm in jede Stadt geschrieben?

In welche Stadt hat Sophie ihm auf jede Art geschrieben?

Result (PLR)

Goal > Manner

A.1.10.6.3 Informational Focus

Sophie hat Michael auf ihre ganz besondere Weise nach Graz geschrieben.
Sophie has Michael in her very special way to Graz written.
'Sophie wrote letters to Michael in her very special way, sending them to Graz.'

Wohin hat Sophie ihm auf ihre ganz besondere Weise geschrieben?
Sie hat ihm nach Graz auf ihre ganz besondere Weise geschrieben.
Sie hat ihm auf ihre ganz besondere Weise nach Graz geschrieben.

Wie hat Sophie ihm nach Graz geschrieben?
Sie hat ihm nach Graz auf ihre ganz besondere Weise geschrieben.
? Sie hat ihm auf ihre ganz besondere Weise nach Graz geschrieben.

Result (IF)

(1,0) Goal > Manner

A.1.10.7 Goal – Comitative

A.1.10.7.1 Quantifier Scope

Sophie hat ihm mit mindestens einer Freundin in jede Stadt geschrieben.
Sophie has him with at least one friend into every town written
'Sophie wrote letters to him with at least one friend, sending them to every town.'

Sophie hat ihm mit mindestens einer Freundin in jede Stadt geschrieben.
∃ (comitative) ∀ (goal)
∀ (goal) ∃ (comitative)

Sophie hat ihm in mindestens eine Stadt mit jeder Freundin geschrieben.
∃ (goal) ∀ (comitative)
? ∀ (comitative) ∃ (goal)

Sophie hat ihm in jede Stadt mit mindestens einer Freundin geschrieben.
∀ (goal) ∃ (comitative)
? ∃ (comitative) ∀ (goal)

Sophie hat ihm mit jeder Freundin in mindestens eine Stadt geschrieben.
∀ (comitative) ∃ (goal)
∃ (goal) ∀ (comitative)
Result (QS)

(1,1,0,0,0,0)  Comitative > Goal2

A.1.10.7.2  Pair-List Reading

Mit welcher Freundin hat Sophie ihm in jede Stadt geschrieben?

→ In welche Stadt hat Sophie ihm mit jeder Freundin geschrieben?

Result (PLR)

Comitative > Goal

A.1.10.7.3  Informational Focus

Sophie hat ihm mit Brigitte nach Rom geschrieben.
Sophie has him with Brigitte to Rome written.
'Sophie wrote letters to him with Brigitte, sending them to Rome.'

Wohin hat Sophie ihm mit Brigitte geschrieben?
Sie hat ihm mit Brigitte nach Rom geschrieben.
?  Sie hat ihm nach Rom mit Brigitte geschrieben.

Mit wem hat Sophie ihm nach Rom geschrieben?
Sie hat ihm mit Brigitte nach Rom geschrieben.
Sie hat ihm nach Rom mit Brigitte geschrieben.

Result (IF)

(1,0)  Comitative > Goal

A.1.10.8  Goal – Evidential

A.1.10.8.1  Quantifier Scope

Because of her extensive writing of love letters to Michael during the working hours, Sophie was not allowed, any longer, to write letters to him, when he was travelling. Peter, Paul and Mary were ordered to supervise her. But she couldn't refuse to write him…

Sophie hat ihm gemäß mindestens einem Kollegen in jede Stadt geschrieben.
Sophie has him according to at least one colleague in every town written.
'According to at least one colleague, Sophie wrote letters to him, sending to every town.'

Sophie hat ihm gemäß mindestens einem Kollegen in jede Stadt geschrieben.
∃ (witness) ∀ (goal)

?  ∀ (goal) ∃ (witness)

Sophie hat ihm in mindestens eine Stadt gemäß jedem Kollegen geschrieben.
∃ (goal) ∀ (witness)

∀ (witness) ∃ (goal)
Sophie hat ihm in jede Stadt gemäß mindestens einem Kollegen geschrieben.
\( \forall (\text{goal}) \exists (\text{witness}) \)
\( \exists (\text{witness}) \forall (\text{goal}) \)

Sophie hat ihm gemäß jedem Kollegen in mindestens eine Stadt geschrieben.
\( \forall (\text{witness}) \exists (\text{goal}) \)
\( \exists (\text{goal}) \forall (\text{witness}) \)

Result (QS)

\((1,2,0,0,1,1)\) Evidential > Goal

A.1.10.8.2 Pair-List Reading

Gemäß welchem Kollegen hat Sophie ihm in jede Stadt geschrieben?

→ In welche Stadt hat Sophie ihm gemäß jedem Kollegen geschrieben?

Result (PLR)

Evidential > Goal

A.1.10.8.3 Informational Focus

Sophie hat ihm gemäß Peter nach Prag geschrieben.
Sophie has him according to Peter to Prague written.
' According to Peter, Sophie wrote letters to him, sending them to Prague.'

Wohin hat Sophie ihm gemäß Peter geschrieben?
Sie hat ihm gemäß Peter nach Prag geschrieben.
? Sie hat ihm nach Prag gemäß Peter geschrieben.

Gemäß wem hat Sophie ihm nach Prag geschrieben?
Sie hat ihm gemäß Peter nach Prag geschrieben.
Sie hat ihm nach Prag gemäß Peter geschrieben.

Result (IF)

\((2,1)\) Evidential > Goal

A.1.10.9 Goal – Matter

A.1.10.9.1 Quantifier Scope

Sophie hat ihm über mindestens ein Thema in jede Stadt berichtet.
Sophie has him about at least one subject into every town reported
'Sophie told him about at least one subject, sending her reports to every town.'

Sophie hat ihm über mindestens ein Thema in jede Stadt berichtet.
\( \exists (\text{matter}) \forall (\text{goal}) \)
\( \forall (\text{goal}) \exists (\text{matter}) \)
Sophie hat ihm in mindestens eine Stadt über jedes Thema berichtet.
∃ (goal) ∀ (matter)

∀ (matter) ∃ (goal)

Sophie hat ihm in jede Stadt über mindestens ein Thema berichtet.
∀ (goal) ∃ (matter)

∃ (matter) ∀ (goal)

Sophie hat ihm über jedes Thema in mindestens eine Stadt berichtet.
∀ (matter) ∃ (goal)
∃ (goal) ∀ (matter)

Result (QS)

(1,2,0,0,0,0) Goal > Matter

A.1.10.9.2 Pair-List Reading

→ Über welches Thema hat sie ihm in jede Stadt geschrieben?
In welche Stadt hat sie ihm über jedes Thema geschrieben?

Result (PLR)

Goal > Matter

A.1.10.9.3 Informational Focus

Sophie hat Hans über die Wahlen nach München geschrieben.
Sophie has Hans about the elections to Munich written.
'Sophie wrote a letter to Hans about the elections, sending it to Munich.'

Worüber hat Sophie Hans nach München geschrieben?
Sie hat ihm nach München über die Wahlen geschrieben.
?? Sie hat ihm über die Wahlen nach München geschrieben.

Wohin hat Sophie Hans über die Wahlen geschrieben?
Sie hat ihm über die Wahlen nach München geschrieben.
Sie hat ihm nach München über die Wahlen geschrieben.

even better:

Wovon hat Sophie Hans nach München berichtet?
?? Sie hat ihm von den Wahlen nach München berichtet.
Sie hat ihm nach München von den Wahlen berichtet.

Wohin hat Sophie Hans über die Wahlen geschrieben?
Sie hat ihm von den Wahlen nach München berichtet.
Sie hat ihm nach München von den Wahlen berichtet.
Result (IF)

(2,0)  Goal > Matter (über)
(2,0)  Goal > Matter (von)

A.1.11  Source

A.1.11.1  Source – Temporal

A.1.11.1.1  Quantifier Scope

Michael was travelling between Madrid, Paris and London. He used to write his family letters from time to time

Michael hat in mindestens einem Jahr aus jeder Stadt geschrieben.
Michael has in at least one year from every city
'Michael wrote letters from every city in at least year.'

Michael hat in mindestens einem Jahr aus jeder Stadt geschrieben.
∃ (time) ∀ (source)
?? ∀ (source) ∃ (time)

Michael hat aus mindestens einer Stadt in jedem Jahr geschrieben.
∃ (source) ∀ (time)
∀ (time) ∃ (source)

Michael hat aus jeder Stadt in mindestens einem Jahr geschrieben.
∀ (source) ∃ (time)
∃ (time) ∀ (source)

Michael hat in jedem Jahr aus mindestens einer Stadt geschrieben.
∀ (time) ∃ (source)
*  ∃ (source) ∀ (time)

Result (QS)

(2,3,0,0,1,0)  Temporal > Source

A.1.11.1.2  Pair-List Reading

In welchem Jahr hat er aus jeder Stadt geschrieben?

→ Aus welcher Stadt hat er in jedem Jahr geschrieben?

Result (PLR)

Temporal > Source
A.1.11.3 Informational Focus

Michael hat ihr am Donnerstag aus Madrid geschrieben
Michael has her on Thursday from Madrid written.
'Michael wrote a letter to her from Madrid on Thursday.'

Wann hat ihr Michael aus Madrid geschrieben?
Er hat ihr aus Madrid am Donnerstag geschrieben.
Er hat ihr am Donnerstag aus Madrid geschrieben.

Woher hat er ihr am Donnerstag geschrieben?
Er hat ihr am Donnerstag aus Madrid geschrieben.
* Er hat ihr aus Madrid am Donnerstag geschrieben.

Result (IF)

(3,1) Temporal > Source

A.1.11.2 Source – Benefactive

A.1.11.2.1 Quantifier Scope

The famous boy group "Romantic Castrates" was on a world tour. Every day they every member received hundreds of members. Their manager wanted them to be answered personally, but since nobody of the group was able to write he hired Bernd to do this job.

Bernd hat für mindestens ein Mitglied aus jeder Stadt geantwortet.
Bernd has for at least one member from every city answered.
'From every city Bernd answered for at least one member.'

Bernd hat für mindestens ein Mitglied aus jeder Stadt geantwortet.
∃ (beneficiary) ∀ (source)
∀ (source) ∃

Bernd hat aus mindestens einer Stadt für jedes Mitglied geantwortet.
∃ (source) ∀ (beneficiary)
∀ (beneficiary) ∃ (source)

Bernd hat aus jeder Stadt für mindestens ein Mitglied geantwortet.
∀ (source) ∃ (beneficiary)
∃ (beneficiary) ∀ (source)

Bernd hat für jedes Mitglied aus mindestens einer Stadt geantwortet.
∀ (beneficiary) ∃ (source)
?? ∃ (source) ∀ (beneficiary)

Result (QS)

(1,2,0,0,0,0) Benefactive > Source
A.1.11.2.2 Pair-List Reading

→ Aus welcher Stadt hat er für jedes Mitglied geantwortet?
   Für welches Mitglied hat er aus jeder Stadt geantwortet?

Result (PLR)

Benefactive > Source

A.1.11.2.3 Informational Focus

Bernd hat für Sweet Michael aus Berlin geantwortet.
Bernd has for Sweet Michael from Berlin answered.
'From Berlin Bernd answered for Sweet Michael.'

Woher hat Bernd für Sweet Michael geantwortet?
Er hat für Sweet Michael aus Berlin geantwortet.
? Er hat aus Berlin für Sweet Michael geantwortet.

Für wen hat Bernd aus Berlin geantwortet?
Er hat für Sweet Michael aus Berlin geantwortet.
Er hat aus Berlin für Sweet Michael geantwortet.

Result (IF)

(1,1) Benefactive > Source

A.1.11.3 Source – Reason

A.1.11.3.1 Quantifier Scope

Hans was away from home for a week. He was lovesick, missed his wife and had pricks of conscience. Because of all this reasons he wrote to his wife quite frequently.

Hans hat Helga aus mindestens einem Grund aus jeder Stadt geschrieben.
Hans has Helga(Dat) because of at least one reason from every city written.
'Hans wrote to Helga from every city because of at least one reason.'

Hans hat Helga aus mindestens einem Grund aus jeder Stadt geschrieben.
∃ (reason) ∀ (source)
∀ (source) ∃ (reason)

Hans hat Helga aus mindestens einer Stadt aus jedem Grund geschrieben.
∃ (source) ∀ (reason)
∀ (reason) ∃ (source)

Hans hat Helga aus jeder Stadt aus mindestens einem Grund geschrieben.
∀ (source) ∃ (reason)
∃ (reason) ∀ (source)
Hans hat Helga aus jedem Grund aus mindestens einer Stadt geschrieben.
∀ (reason) ∃ (source)
∃ (source) ∀ (reason)

Nachfeld

Hans hat Helga aus mindestens einem Grund geschrieben aus jeder Stadt.
∃ (reason) ∀ (source)
* ∀ (source) ∃ (reason)

Hans hat Helga aus mindestens einer Stadt geschrieben aus jedem Grund.
∃ (source) ∀ (reason)
* ∀ (reason) ∃ (source)

Hans hat Helga aus jeder Stadt geschrieben aus mindestens einem Grund.
* ∀ (source) ∃ (reason)
∃ (reason) ∀ (source)

Hans hat Helga aus jedem Grund geschrieben aus mindestens einer Stadt.
∀ (reason) ∃ (source)
* ∃ (source) ∀ (reason)

Result (QS)

(0,1,0,0,0,0) +1 Reason > Source

A.1.11.3.2 Pair-List Reading

Aus welchem Grund hat Hans ihr aus jeder Stadt geschrieben?
→ Aus welcher Stadt hat Hans ihr aus jedem Grund geschrieben?
Wegen welchem Auftrag hat Hans ihr aus jeder Stadt geschrieben?
→ Aus welcher Stadt hat Hans ihr wegen jedem Auftrag geschrieben?

Result (PLR)

Reason > Source

A.1.11.3.3 Informational Focus

Hans hat Helga aus Liebeskummer aus Hannover geschrieben.
Hans has Helga because of lovesickness from Hannover written
"Hans wrote Helga from Hannover because of lovesickness."

Warum hat Hans der Helga aus Hannover geschrieben?
Er hat ihr aus Hannover aus Liebeskummer geschrieben.
Er hat ihr aus Liebeskummer aus Hannover geschrieben.
Woher hat Hans der Helga wegen schlechten Gewissens geschrieben?
Er hat ihr aus Liebeskummer aus Hannover geschrieben.
?? Er hat ihr aus Hannover aus Liebeskummer geschrieben.

Warum hat Hans der Helga aus Hannover geschrieben?
Er hat ihr aus Hannover wegen schlechten Gewissens geschrieben.
Er hat ihr wegen schlechten Gewissens aus Hannover geschrieben.

Woher hat Hans der Helga aus Liebeskummer geschrieben?
Er hat ihr wegen schlechten Gewissens aus Hannover geschrieben.
?? Er hat ihr aus Hannover wegen schlechten Gewissens geschrieben.

Result (IF)

(2,0) Reason > Source

A.1.11.4 Source – Locative

A.1.11.4.1 Quantifier Scope

Hans was at travelling salesman who had three big clients who had branches in every big city. Every month he travelled to every city and wrote reports to his boss.

Hans hat in mindestens einer Stadt von jedem Kunden geschrieben.
Hans has in at least one city from every client written
'Hans wrote letters from the place of every client in at least one city.'

("von jedem Kunden" is ambiguous between source and matter. To disambiguate it is possible to add the preposition "aus": "von jedem Kunden aus", which is clearly source)

Hans hat von mindestens einem Kunden (aus) in jeder Stadt geschrieben.
∃ (source) ∀ (place)
∀ (place) ∃ (source)

Hans hat von jedem Kunden (aus) in mindestens einer Stadt geschrieben.
∀ (source) ∃ (place)
∃ (place) ∀ (source)

Hans hat in jeder Stadt von mindestens einem Kunden (aus) geschrieben.
∀ (place) ∃ (source)
?? ∃ (source) ∀ (place)

Result (QS)

(2,2,0,0,0,1) Locative > Source
A.11.4.2  Pair-List Reading

→ Von welchem Kunden (aus) hat er in jeder Stadt geschrieben?
In welcher Stadt hat er von jedem Kunden (aus) geschrieben?

Result (PLR)

Locative > Source

A.11.4.3  Informational Focus

Hans hat in Hamburg vom Hauptpostamt geschrieben.
Hans has in Hamburg from the main post office written
'Hans wrote letters from the main post office while being in Hamburg.'

Woher hat Hans in Hamburg geschrieben.
Er hat in Hamburg vom Hauptpostamt geschrieben.
? Er hat vom Hauptpostamt in Hamburg geschrieben.

Wo hat Hans vom Hauptpostamt geschrieben?
Er hat in Hamburg vom Hauptpostamt geschrieben.
Er hat vom Hauptpostamt in Hamburg geschrieben.

Result (IF)

(1,1)  Locative > Source

A.11.5  Source – Instrumental

A.11.5.1  Quantifier Scope

Sophie gave Hans a set of different pens as a birthday present, so that he could write her in different
colours, when he was travelling on his various trips through Europe!

Hans hat ihr mit mindestens einem Füller aus jeder Stadt geschrieben.
Hans has her with at least one pen from every town written
'Hans wrote letters to her from every town with at least one pen.'

Hans hat ihr mit mindestens einem Füller aus jeder Stadt geschrieben.
∃ (instrument) ∀ (source)
∀ (source) ∃ (instrument)

Hans hat ihr aus mindestens einer Stadt mit jedem Füller geschrieben.
∃ (source) ∀ (instrument)
∀ (instrument) ∃ (source)

Hans hat ihr aus jeder Stadt mit mindestens einem Füller geschrieben.
∀ (source) ∃ (instrument)
? ∃ (instrument) ∀ (source)
Hans hat ihr mit jedem Füller aus mindestens einer Stadt geschrieben.
∀ (instrument) ∃ (source)
∃ (source) ∀ (instrument)

Result (QS)

(0,1,0,0,0) Source > Instrumental

A.1.11.5.2 Pair-List Reading

→ Mit welchem Füller hat Hans ihr aus jeder Stadt geschrieben?
Aus welcher Stadt hat Hans ihr mit jedem Füller geschrieben?

Result (PLR)

Source > Instrumental

A.1.11.5.3 Informational Focus

Hans hat Sophie aus München mit dem roten Füller geschrieben.
Hans has Sophie from Munich with the red pen written
'Hans wrote letters to Sophie with the red pen from Munich.'

Woher hat Hans ihr mit dem roten Füller geschrieben?
Er hat ihr aus München mit dem roten Füller geschrieben.
Er hat ihr mit dem roten Füller aus München geschrieben.

Mit was hat er ihr aus München geschrieben?
? Er hat ihr aus München mit dem roten Füller geschrieben.
Er hat ihr mit dem roten Füller aus München geschrieben.

Result (IF)

(1,0) Source > Instrumental

A.1.11.6 Source – Manner

A.1.11.6.1 Quantifier Scope

During his journey Hans was in very different moods, that effected his way of writing. Sometimes he was very romantic, on other day very technical. He wrote enthusiastic ways and in boring stiles.

Hans hat ihr auf mindestens eine Weise aus jeder Stadt geschrieben.
Hans has her in at least one way from every city written.
'Hans wrote letters to her from every city in at least one way.'

Hans hat ihr auf mindestens eine Weise aus jeder Stadt geschrieben.
∃ (manner) ∀ (source)
∀ (source) ∃ (manner)
Hans hat ihr aus mindestens einer Stadt auf jede Weise geschrieben.

∃ (source) ∀ (manner)

?? ∀ (manner) ∃ (source)

Hans hat ihr aus jeder Stadt auf mindestens eine Weise geschrieben.

∀ (source) ∃ (manner)

* ∃ (manner) ∀ (source)

Hans hat ihr auf jede Weise aus mindestens einer Stadt geschrieben.

∀ (manner) ∃ (source)

∃ (source) ∀ (manner)

Result (QS)

(2,3,0,0,0,1) Source > Manner

A.1.11.6.2 Pair-List Reading

→ Auf welcher Weise hat Hans ihr aus jeder Stadt geschrieben?

Aus welcher Stadt hat Hans ihr auf jede Weise geschrieben?

Result (PLR)

Source > Manner

A.1.11.6.3 Informational Focus

Hans hat Sophie auf seine ganz besondere Weise aus Salzburg geschrieben.
Hans has Sophie in his very special kind from Salzburg written
'Hans wrote letters to Sophie in his very special kind from Salzburg.'

Woher hat er Sophie auf seine ganz besondere Weise geschrieben?
Er hat ihr aus Salzburg auf seine ganz besondere Weise geschrieben.
Er hat ihr auf seine ganz besondere Weise aus Salzburg geschrieben.

Wie hat er Sophie aus Salzburg geschrieben?
Er hat ihr aus Salzburg auf seine ganz besondere Weise geschrieben.
? Er hat ihr auf seine ganz besondere Weise aus Salzburg geschrieben.

Result (IF)

(1,1) Source > Manner

A.1.11.7 Source – Comitative

A.1.11.7.1 Quantifier Scope

Hans hat ihr mit mindestens einem Kollegen aus jeder Stadt geschrieben.
Hans has her with at least one colleague from every city written
'Hans wrote letters to her from every city with at least one colleague.'
Hans hat ihr mit mindestens einem Kollegen aus jeder Stadt geschrieben.
∃ (comitative) ∀ (source)
∀ (source) ∃ (comitative)

?? Hans hat ihr aus mindestens einer Stadt mit jedem Kollegen geschrieben.
∃ (source) ∀ (comitative)
∀ (comitative) ∃ (source)

?? Hans hat ihr aus jeder Stadt mit mindestens einem Kollegen geschrieben.
∀ (source) ∃ (comitative)
? ∃ (comitative) ∀ (source)

Hans hat ihr mit jedem Kollegen aus mindestens einer Stadt geschrieben.
∀ (comitative) ∃ (source)
∃ (source) ∀ (comitative)

The Sentences with the Comitative to the right of the locative are odd (at least when modified by quantifiers). So while these sentences are perfect to evaluate the PLR and the IF test, I am not able to evaluate them properly with the QS test. So I tried with another pair of sentences, introducing the famous Spanish stewardess Azafatta:

Azafatta, ist mit mindestens einer Kollegin von jedem Flughafen Europas geflogen.
Azafatta is with at least one colleague from every airport Europe-Gen flown.
'Azafatta flew from every airport with at least one colleague.'

Azafatta ist mit mindestens einer Kollegin von jedem Flughafen Europas geflogen.
∃ (comitative) ∀ (source)
∀ (source) ∃ (comitative)

Azafatta ist von mindestens einem Flughafen mit jeder Kollegin geflogen.
∃ (source) ∀ (comitative)
?? ∀ (comitative) ∃ (source)

Azafatta ist von jedem Flughafen Europas mit mindestens einer Kollegin geflogen.
∀ (source) ∃ (comitative)
∃ (comitative) ∀ (source)

Azafatta ist mit jeder Kollegin von mindestens einem Flughafen geflogen.
∀ (comitative) ∃ (source)
? ∃ (source) ∀ (comitative)

Result (QS)

(2,1,0,0,0,0) Comitative > Source
A.1.11.7.2  
**Pair-List Reading**

Mit welchem Kollegen hat Hans ihr aus jeder Stadt geschrieben?

→ Aus welcher Stadt hat Hans ihr mit jedem Kollegen geschrieben?

**Result (PLR)**

**Comitative > Source**

A.1.11.7.3  
**Informational Focus**

Hans hat ihr mit Franz aus Mannheim geschrieben.
Hans has her with Franz from Mannheim written.
'Hans wrote letters to her from Mannheim (together) with Franz.'

Woher hat Hans ihr mit Franz geschrieben?
Er hat ihr mit Franz *aus Mannheim* geschrieben.
? Er hat ihr *aus Mannheim* mit Franz geschrieben.

Mit wem hat er ihr aus Mannheim geschrieben?
Er hat ihr aus Mannheim *mit Franz* geschrieben.
Er hat ihr *mit Franz* aus Mannheim geschrieben.

**Result (IF)**

(1,0)  
**Comitative > Source**

A.1.11.8  
**Source – Evidential**

A.1.11.8.1  
**Quantifier Scope**

Hans hat ihr gemäß mindestens eines Kollegen aus jeder Stadt geschrieben.
Hans has her according to at least one colleague from every city written
'According to at least one colleague, Hans wrote letters to her from every city.'

Hans hat ihr gemäß mindestens eines Kollegen aus jeder Stadt geschrieben.
∃ (witness) ∀ (source)

? ∀ (source) ∃ (witness)

Hans hat ihr aus mindestens einer Stadt gemäß jedes Kollegen geschrieben.
∃ (source) ∀ (witness)

∀ (witness) ∃ (source)

Hans hat ihr aus jeder Stadt gemäß mindestens eines Kollegen geschrieben.
∀ (source) ∃ (witness)

∃ (witness) ∀ (source)

Hans hat ihr gemäß jedes Kollegen aus mindestens einer Stadt geschrieben.
∀ (witness) ∃ (source)

?? ∃ (source) ∀ (witness)
Result (QS)

(1,2,0,0,1,0) Evidential > Source

A.1.11.8.2 Pair-List Reading

Gemäß welchem Kollegen hat Hans ihr aus jeder Stadt geschrieben?

→ Aus welcher Stadt hat Hans ihr gemäß jedem Kollegen geschrieben?

Result (PLR)

Evidential > Source

A.1.11.8.3 Informational Focus

Hans hat ihr gemäß Brigitte aus Innsbruck geschrieben.
Hans has her according to Brigitte from Innsbruck written.
'According to Brigitte, Hans wrote letters to her from Innsbruck.

Gemäß wem hat Hans ihr aus Innsbruck geschrieben?
Er hat ihr gemäß Brigitte aus Innsbruck geschrieben.
Er hat ihr aus Innsbruck gemäß Brigitte geschrieben.

Woher hat er ihr gemäß Brigitte geschrieben?
? Er hat ihr aus Innsbruck gemäß Brigitte geschrieben.
Er hat ihr gemäß Brigitte aus Innsbruck geschrieben.

Result (IF)

(1,0) Evidential > Source

A.1.11.9 Source – Matter

A.1.11.9.1 Quantifier Scope

Hans was on a journey through Europe's capitals for a famous publishing house. His task was to write articles about culture, nature and politics. Every week he wrote to his editor a letter with different topics.

Hans hat ihm über mindestens ein Thema aus jeder Hauptstadt geschrieben.
Hans has him about every topic from every capital written
'Hans wrote letters to him from every capital about every topic.'

Hans hat ihm über mindestens ein Thema aus jeder Hauptstadt geschrieben.
∃ (matter) ∀ (source)
∀ (source) ∃ (matter)

Hans hat ihm aus mindestens einer Hauptstadt über jedes Thema geschrieben.
∃ (source) ∀ (matter)
?? ∀ (matter) ∃ (source)
Hans hat ihm aus jeder Hauptstadt über mindestens ein Thema geschrieben.
∀ (source) ∃ (matter)
∃ (matter) ∀ (source)

Hans hat ihm über jedes Thema aus mindestens einer Hauptstadt geschrieben.
∀ (matter) ∃ (source)
∃ (source) ∀ (matter)

Result (QS)
(2,2,0,0,0) Source > Matter

A.1.11.9.2 Pair-List Reading

Aus welcher Hauptstadt hat Hans ihm über jedes Thema geschrieben?

→ Über welches Thema hat Hans ihm aus jeder Hauptstadt geschrieben?

Result (PLR)
Source > Matter

A.1.11.9.3 Informational Focus

Hans hat aus Salzburg über schlechtes Wetter berichtet.
Hans has from Salzburg about bad weather reported.
'Hans reported about bad weather from Salzburg.'

Woher hat Hans über schlechtes Wetter berichtet?
Hans hat aus Salzburg über schlechtes Wetter berichtet.
Hans has from Salzburg about bad weather reported.

Über was hat Hans aus Salzburg berichtet?
Hans hat aus Salzburg über schlechtes Wetter berichtet.


Result (IF)
(1,1) Source > Matter

A.1.11.10 Source – Goal

A.1.11.10.1 Quantifier Scope

Hans hat ihr an mindestens einer Adresse aus jeder Stadt geschrieben.
Hans has her to at least one address from every city written
'Hans wrote letters to her from every city, sending them to at least one address.'

Hans hat ihr an mindestens eine Adresse aus jeder Stadt geschrieben.
∃ (goal) ∀ (source)
∀ (source) ∃ (goal)
Hans hat ihr aus mindestens einer Stadt an jede Adresse geschrieben.
∃ (source) ∀ (goal)
?
∀ (goal) ∃ (source)

Hans hat ihr aus jeder Stadt an mindestens eine Adresse geschrieben.
∀ (source) ∃ (goal)
?
∃ (goal) ∀ (source)

Hans hat ihr an jede Adresse aus mindestens einer Stadt geschrieben.
∀ (goal) ∃ (source)
∃ (source) ∀ (goal)

Result (QS)

(1,1,0,0,0,0) Source > Goal

A.1.11.10.2 Pair-List Reading

→ An welche Adresse hat er ihr aus jeder Stadt geschrieben?

Aus welcher Stadt hat er ihr an jede Adresse geschrieben?

Result (PLR)

Source > Goal

A.1.11.10.3 Informational Focus

Hans hat ihr aus Stuttgart nach Wien geschrieben.
Hans has her from Stuttgart to Vienna written.
'Hans wrote a letter to her from Stuttgart, sending it to Vienna.'

Woher hat ihr Hans nach Wien geschrieben?
Hans hat ihr aus Stuttgart nach Wien geschrieben.
Hans hat ihr nach Wien aus Stuttgart geschrieben.

Wohin hat ihr Hans aus Stuttgart geschrieben?
Hans hat ihr nach Wien aus Stuttgart geschrieben.

Result (IF)

(1,1) Source > Goal
A.1.12    Path

A.1.12.1   Path – Temporal

A.1.12.1.1   Quantifier Scope

Hans was a truck driver who enjoyed the landscape of the region he was driving. In order to see different sites he used to take different routes. In December he had to go from Mainz to Bad Kreuznach and had to choice to pass Gau-Algesheim, Bingen or Ingelheim or any combination of the three small villages.

Hans ist an mindestens einem Tag über jedes Dorf gefahren.
Hans is on at least one day over every village gone.
'Hans went through every village on at least one day.'

Hans ist an mindestens einem Tag über jedes Dorf gefahren.
∃ (time) ∀ (path)

? ∀ (path) ∃ (time)

Hans ist über mindestens ein Dorf an jedem Tag gefahren.
∃ (path) ∀ (time)
∀ (time) ∃ (path)

Hans ist über jedes Dorf an mindestens einem Tag gefahren.
∀ (path) ∃ (time)
∃ (time) ∀ (path)

Hans ist an jedem Tag über mindestens ein Dorf gefahren.
∀ (time) ∃ (path)
* ∃ (path) ∀ (time)

Result (QS)

(1,3,0,0,0,1) Temporal > Path

A.1.12.1.2   Pair-List Reading

An welchem Tag ist Hans über jedes Dorf gefahren?

→ Über welches Dorf ist Hans an jedem Tag gefahren?

Result (PLR)

Temporal > Path

A.1.12.1.3   Informational Focus

Hans ist am Sonntag über Bingen gefahren.
Hans is on Sunday over Bingen gone.
'Hans went (drove) through Bingen on Sunday.'
Über was ist Hans am Sonntag gefahren?
Er ist am Sonntag über Bingen gefahren.
* Er ist über Bingen am Sonntag gefahren.

Wann ist Hans über Bingen gefahren?
Er ist am Sonntag über Bingen gefahren.
Er ist über Bingen am Sonntag gefahren.

Result (IF)

(3,1) Temporal > Path

A.1.12.2 Path – Benefactive

A.1.12.2.1 Quantifier Scope

Because Hans was low of money he had to work for different companies. It was funny, that his travelling route seemed to be dependant of the company

Hans ist für mindestens eine Firma über jedes Dorf gefahren.
Hans is for at least one company over ever village gone.
'Hans went through every village for at least one company.'

Hans ist für mindestens eine Firma über jedes Dorf gefahren.
∃ (beneficiary) ∀ (path)
?
∀ (path) ∃ (beneficiary)

Hans ist über mindestens ein Dorf für jede Firma gefahren.
∃ (path) ∀ (beneficiary)
∀ (beneficiary) ∃ (path)

Hans ist über jedes Dorf für mindestens eine Firma gefahren.
∀ (path) ∃ (beneficiary)
∃ (beneficiary) ∀ (path)

Hans ist für jede Firma über mindestens ein Dorf gefahren.
∀ (beneficiary) ∃ (path)
? ∃ (path) ∀ (beneficiary)

Result (QS)

(1,1,0,0,0,0) Benefactive > Path

A.1.12.2.2 Pair-List Reading

Für welche Firma ist Hans über jedes Dorf gefahren?

→ Über welches Dorf ist Hans für jede Firma gefahren?
Result (PLR)

Benefactive > Path

A.1.12.2.3 Informational Focus

Hans ist für "Schweinerei & Co" über Bingen gefahren.  
Hans is for "Schweinerei & Co" over Bingen gone.  
'Hans went through Bingen for "Schweinerei & Co".'

Für wen ist Hans über Bingen gefahren?
Hans ist für "Schweinerei & Co" über Bingen gefahren.

Über was ist Hans für "Schweinerei & Co" gefahren?
Hans ist über Bingen für "Schweinerei & Co" gefahren.

Result (IF)

(1,1) Benefactive > Path

A.1.12.3 Path – Reason

A.1.12.3.1 Quantifier Scope

(Here it is necessary to add explicitly the goal to avoid narrow scope of Reason over Path in every case).
Hans had to deliver different goods, every connect with a different order, that caused him to go to Bad Kreuznach.

Hans ist wegen mindestens einem Auftrag über jedes Dorf nach Bad Kreuznach gefahren.  
Hans is because of at least one order over every village to Bad Kreuznach gone  
'Hans went to Bad Kreuznach through every village because of at least one order.'

Hans ist wegen mindestens einem Auftrag über jedes Dorf nach Bad Kreuznach gefahren.  
∃ (reason) ∀ (path)  
∀ (path) ∃ (reason)

Hans ist über mindestens ein Dorf wegen jedem Auftrag nach Bad Kreuznach gefahren.  
∃ (path) ∀ (reason)  
∀ (reason) ∃ (path)

Hans ist über jedes Dorf wegen mindestens einem Auftrag nach Bad Kreuznach gefahren.  
∀ (path) ∃ (reason)  
∃ (reason) ∀ (path)

Hans ist wegen jedem Auftrag über mindestens ein Dorf nach Bad Kreuznach gefahren.  
∀ (reason) ∃ (path)  
∃ (path) ∀ (reason)
Nachfeld

Hans ist wegen mindestens einem Auftrag nach Bad Kreuznach gefahren über jedes Dorf.
∃ (reason) ∀ (path)
* ∀ (path) ∃ (reason)

Hans ist über mindestens ein Dorf nach Bad Kreuznach gefahren wegen jedem Auftrag.
* ∃ (path) ∀ (reason)
∀ (reason) ∃ (path)

Hans ist über jedes Dorf nach Bad Kreuznach gefahren wegen mindestens einem Auftrag.
* ∀ (path) ∃ (reason)
∃ (reason) ∀ (path)

Hans ist wegen jedem Auftrag nach Bad Kreuznach gefahren über mindestens ein Dorf.
∀ (reason) ∃ (path)
* ∃ (path) ∀ (reason)

Result (QS)

(0,1,0,0,0,0) + 1 Reason > Path

A.1.12.3.2 Pair-List Reading

→ Über welches Dorf ist er wegen jedem Auftrag gefahren?
Wegen welchem Auftrag ist er über jedes Dorf gefahren?

Result (PLR)

Reason > Path

A.1.12.3.3 Informational Focus

Hans ist wegen der Eierlieferung über Bingen nach Bad Kreuznach gefahren.
Hans is because of the delivery of eggs over Bingen to Bad Kreuznach gone.
'Hans went to Bad Kreuznach through Bingen because of the egg delivery.'

Warum ist Hans über Bingen nach Bad Kreuznach gefahren?
Er ist wegen der Eierlieferung über Bingen nach Bad Kreuznach gefahren.
Er ist über Bingen wegen der Eierlieferung nach Bad Kreuznach gefahren.

Worüber ist Hans wegen der Eierlieferung nach Bad Kreuznach gefahren?
Er ist wegen der Eierlieferung über Bingen nach Bad Kreuznach gefahren.
? Er ist über Bingen wegen der Eierlieferung nach Bad Kreuznach gefahren.

Result (IF)

(1,0) Reason > Path
A.1.12.4 Path – Locative

A.1.12.4.1 Quantifier Scope

Michael was now in America. The mail couldn’t be sent directly to his address, but over London, Paris or Milan. Sophie, who was travelling herself all over Europe sent him letters from all the places she had been, deciding every time which route the letter should take.

Sophie hat Briefe in mindestens einem Land über jede Stadt gesendet.
'Sophie has letters in at least one country over every city sent.'

Sophie hat ihre Briefe in mindestens einem Land über jede Stadt geschickt.

∀ (path) ∃ (place)
* ∀ (place) ∃ (path)

Sophie hat ihre Briefe über mindestens eine Stadt in jedem Land geschickt.

∃ (path) ∀ (place)
∀ (place) ∃ (path)

Sophie hat ihre Briefe über jede Stadt in mindestens einem Land geschickt.

∀ (path) ∃ (place)
∃ (place) ∀ (path)

Sophie hat ihre Briefe in jedem Land über mindestens eine Stadt geschickt.

∀ (place) ∃ (path)
* ∃ (path) ∀ (place)

Result (QS)

(3,3,0,0,0,0) Locative > Path

A.1.12.4.2 Pair-List Reading

In welchem Land hat Sophie sie über jede Stadt verschickt?

→ Über welche Stadt hat Sophie sie in jedem Land verschickt?

Result (PLR)

Locative > Path

A.1.12.4.3 Informational Focus

'Sophie wrote her letters in England, sending them over London.'

Worüber hat Sophie ihre Briefe in England verschickt?
Sie hat sie in England über London verschickt.

?? Sie hat sie über London in England verschickt.
Wo hat Sophie ihre Briefe über London verschickt?

Sie hat sie in England über London verschickt.

Sie hat sie über London in England verschickt.

Result (IF)

(2,1) Locative > Path

A.1.12.5 Path – Instrumental

A.1.12.5.1 Quantifier Scope

Hans had a brother, Thomas, who was a pilot at the Lufthansa. Thomas used to fly daily from Berlin to Tokyo. Depending on the weather he had to take different routes. Since he wanted to be prepared for the worst case he trained to fly the plane with different instruments.

Thomas hat das Flugzeug mit mindestens einem Instrument über jede Route geflogen. Thomas has the airplane with at least one instrument over every route flown. 'Thomas navigated the airplane over every route with at least one instrument.'

Thomas hat das Flugzeug mit mindestens einem Instrument über jede Route geflogen.

∃ (instrument) ∀ (path)
∀ (path) ∃ (instrument)

Thomas hat das Flugzeug über mindestens eine Route mit jedem Instrument geflogen.

∃ (path) ∀ (instrument)
?
∀ (instrument) ∃ (path)

Thomas hat das Flugzeug über jede Route mit mindestens einem Instrument geflogen.

∀ (path) ∃ (instrument)
∃ (instrument) ∀ (path)

Thomas hat das Flugzeug mit jedem Instrument über mindestens eine Route geflogen.

∀ (instrument) ∃ (path)
∃ (path) ∀ (instrument)

Result (QS)

(1,0,0,0,0,0) Path > Instrumental

A.1.12.5.2 Pair-List Reading

→ Über welche Route hat er das Flugzeug mit jedem Instrument geflogen?

Mit welchem Instrument hat er das Flugzeug über jede Route geflogen?

Result (PLR)

Instrumental > Path
A.1.12.5.3 **Informational Focus**

Thomas hat das Flugzeug über die Nordroute mit dem Autopiloten geflogen.
Thomas has the airplane over the northern route with the autopilot flown.
'Thomas navigated the airplane with the autopilot over the northern route.'

Worüber hat Thomas das Flugzeug mit dem Autopiloten geflogen?
Er hat es mit dem Autopiloten über die Nordroute geflogen.
Er hat es *über die Nordroute* mit dem Autopiloten geflogen.

Mit was hat Thomas das Flugzeug über die Nordroute geflogen?
Er hat es mit dem Autopiloten über die Nordroute geflogen.
Er hat es über die Nordroute *mit dem Autopiloten* geflogen.

**Result (IF)**

(0,0) **Path ? Instrumental**

A.1.12.6 **Path – Manner**

A.1.12.6.1 **Quantifier Scope**

Hans used to drive in very different manners: zigzagging, straight, drunk and with high speed.

Hans ist auf mindestens eine Art über jedes Dorf gefahren.
Hans is in at least one manner over every village gone
'Hans drove (the car) through every village in at least one manner.'

Hans ist auf mindestens eine Art über jedes Dorf gefahren.
∃ (manner) ∀ (path)
∀ (path) ∃ (manner)

Hans ist über mindestens ein Dorf auf jede Art gefahren.
∃ (path) ∀ (manner)
? ∀ (manner) ∃ (path)

Hans ist über jedes Dorf auf mindestens eine Art gefahren.
∀ (path) ∃ (manner)
?? ∃ (manner) ∀ (path)

Hans ist auf jede Art über mindestens ein Dorf gefahren.
∀ (manner) ∃ (path)
∃ (path) ∀ (manner)

**Result (QS)**

(1,2,0,0,0,0) **Path > Manner**
A.1.12.6.2 Pair-List Reading

Über welches Dorf ist Hans auf jede Art gefahren?

→ Auf welche Art ist Hans über jedes Dorf gefahren?

Result (PLR)

Path > Manner

A.1.12.6.3 Informational Focus

Hans ist auf seine ganz spezielle Weise über Bingen gefahren.
Hans is in his very special kind over Bingen gone.
'Hans drove (the truck) through Bingen in his very special kind.'

Worüber ist Hans in seiner ganz speziellen Art gefahren?
Er ist über Bingen in seiner ganz speziellen Art gefahren.
Er is in his very special kind

Wie ist Hans über Bingen gefahren?
Er ist über Bingen in seiner ganz speziellen Art gefahren.
? Er is in his very special kind over Bingen gone.

Result (IF)

(1,0) Path > Manner

A.1.12.7 Path – Comitative

A.1.12.7.1 Quantifier Scope

After the last heavy accident the government forbid truck drivers to ride alone. So Hans had to be accompanied by a colleague. Willi, Uwe or Kai was his usual companion on his way from Mainz to Bad Kreuznach.

Hans ist mit mindestens einem Kollegen über jedes Dorf gefahren
Hans is with at least one colleague over every village gone.
'Hans drove (the truck) through every village with at least one colleague.'

Hans ist mit mindestens einem Kollegen über jedes Dorf gefahren
∃ (comitative) ∀ (path)
∀ (path) ∃ (comitative)

Hans ist über mindestens ein Dorf mit jedem Kollegen gefahren.
∃ (path) ∀ (comitative)
∀ (comitative) ∃ (path)

Hans ist über jedes Dorf mit mindestens einem Kollegen gefahren
∀ (path) ∃ (comitative)
∃ (comitative) ∀ (path)
Hans ist mit jedem Kollegen über mindestens ein Dorf gefahren.
∀ (comitative) ∃ (path)
∃ (path) ∀ (comitative)

Result (QS)

(0,2,0,0,0,0)  Comitative > Path

A.1.12.7.2  Pair-List Reading

→ Über welches Dorf ist er mit jedem Kollegen gefahren?
Mit welchem Kollegen ist er über jedes Dorf gefahren?

Result (PLR)

Comitative > Path

A.1.12.7.3  Informational Focus

Hans ist mit Willi über Bingen gefahren.
Hans is with Willi over Bingen driven
'Hans drove through Bingen with Willi.'

Mit wem ist Hans über Bingen gefahren.

Hans ist mit Willi über Bingen gefahren.
Hans ist über Bingen mit Willi gefahren.

Über was ist Hans mit Willi gefahren?
Hans ist mit Willi über Bingen gefahren.
?? Hans ist über Bingen mit Willi gefahren.

Result (IF)

(2,1)  Comitative > Path

A.1.12.8  Path – Evidential

A.1.12.8.1  Quantifier Scope
After the robbery of the famous jewels of Bingen, Hans was the main suspect of Inspector Klosohl. He asked his girl friends Karin, Gisela and Eva whether they have seen which way Hans took.

Hans ist gemäß mindestens einer Freundin über jedes Dorf gefahren.
Hans is according to at least one girl friend over every village gone.
'According to at least one girl friend Hans drove through every village.'

Hans ist gemäß mindestens einer Freundin über jedes Dorf gefahren.
∃ (witness) ∀ (path)
?? ∀ (path) ∃ (witness)
Hans ist über mindestens ein Dorf gemäß jeder Freundin gefahren.
\[\exists \text{(path)} \forall \text{(witness)}\]
\[\forall \text{(witness)} \exists \text{(path)}\]

Hans ist über jedes Dorf gemäß mindestens einer Freundin gefahren.
\[\forall \text{(path)} \exists \text{(witness)}\]
\[\exists \text{(witness)} \forall \text{(path)}\]

Hans ist gemäß jeder Freundin über mindestens ein Dorf gefahren.
\[\forall \text{(witness)} \exists \text{(path)}\]
\[\exists \text{(path)} \forall \text{(witness)}\]

Result (QS)

(2,3,0,0,0,1) Evidential > Path

A.1.12.8.2 Pair-List Reading

→ Über welches Dorf ist Hans gemäß jeder Freundin gefahren?
Gemäß welcher Freundin ist Hans über jedes Dorf gefahren?

Result (PLR)

Evidential > Path

A.1.12.8.3 Informational Focus

Hans ist gemäß Erika über Ingelheim gefahren.
Hans is according to Erika over Ingelheim gone.
'According to Erika, Hans drove through Ingelheim.'

Worüber ist Hans gemäß Erika gefahren?
Er ist gemäß Erika über Ingelheim gefahren.
?? Er ist über Ingelheim gemäß Erika gefahren.

Gemäß wem ist Hans über Ingelheim gefahren?
Er ist gemäß \textit{Erika über Ingelheim} gefahren.
Er ist über Ingelheim gemäß \textit{Erika} gefahren.

Result (IF)

(2,1) Evidential > Path

A.1.12.9 Path – Matter

A.1.12.9.1 Quantifier Scope
Here again, we have a clash of having the same preposition "über" twice, which doesn't sound quite good. As in the example of the informational focus, you could use "via" for the path preposition, but together with a universal quantifier it sounds odd. So I decided to take in all cases
two "über" prepositions and to abstract away from this oddness while judging the scope ambiguities.

? Sophie hat Hans über mindestens ein Thema über jede Stadt nach New York geschrieben. Sophie has Hans about at least one matter over every city to New York written. 'Sophie wrote letters to Hans about at least one matter through every city, sending them to New York.'

? Sophie hat Hans über mindestens ein Thema über jede Stadt nach New York geschrieben. ∃ (matter) ∀ (path)
∀ (path) ∃ (matter)

? Sophie hat Hans über mindestens eine Stadt über jedes Thema nach New York geschrieben. ∃ (path) ∀ (matter)
∀ (matter) ∃ (path)

? Sophie hat Hans über jede Stadt über mindestens ein Thema nach New York geschrieben. ∀ (path) ∃ (matter)
∃ (matter) ∀ (path)

? Sophie hat Hans über jedes Thema über mindestens eine Stadt nach New York geschrieben. ∀ (matter) ∃ (path)
∃ (path) ∀ (matter)

Result (QS)

(1,1,0,0,0,0) Path > Matter

A.1.12.9.2 Pair-List Reading

→ Über welches Thema hat sie ihm über jede Stadt nach New York geschrieben?
Über welche Stadt hat sie ihm über jedes Thema nach New York geschrieben?

Result (PLR)

Path > Matter

A.1.12.9.3 Informational Focus

Sophie hat Hans via London über Mode geschrieben. Sophie has Hans via London about fashion written. 'Sophie wrote to Hans about fashion via London.'

Über was hat Sophie Hans via London geschrieben? Sie hat ihm via London über Mode geschrieben.
? Sie hat ihm über Mode via London geschrieben.
Worum hat Sophie Hans über Mode geschrieben?
Sie hat ihm via London über Mode geschrieben.
Sie hat ihm über Mode via London geschrieben.

Result (IF)

(1,1) Path > Matter

A.1.12.10 Path – Goal

A.1.12.10.1 Quantifier Scope

Sophie was still travelling around Europe, while Michael was on journey through South America, where he visited different countries. Depending on the place Sophie was writing from, she had to send the mail via different cities.

Sophie hat Michael über mindestens eine Stadt in jedes Land geschrieben.
Sophie has Michael over at least one city in(to) every country written.
'Sophie wrote letters to Michael, sending them over at least one city into every country.'

Sophie hat Michael in mindestens ein Land über jede Stadt geschrieben.
∃ (goal) ∀ (path)
∀ (path) ∃ (goal)

Sophie hat Michael über mindestens eine Stadt in jedes Land geschrieben.
∃ (path) ∀ (goal)
? ∀ (goal) ∃ (path)

Sophie hat Michael über jede Stadt in mindestens ein Land geschrieben.
∀ (path) ∃ (goal)
∃ (goal) ∀ (path)

Sophie hat Michael in jedes Land über mindestens eine Stadt geschrieben.
∀ (goal) ∃ (path)
? ∃ (path) ∀ (goal)

Result (QS)

(0.5,0.5,0,0,0,0) Goal > Path

A.1.12.10.2 Nachfeld

Sophie hat Michael in mindestens ein Land geschrieben über jede Stadt.
∃ (goal) ∀ (path)
∀ (path) ∃ (goal)

Sophie hat Michael über mindestens eine Stadt geschrieben in jedes Land.
∃ (path) ∀ (goal)
∀ (goal) ∃ (path)
Sophie hat Michael über jede Stadt geschrieben in mindestens ein Land.

∀ (path) ∃ (goal)
∃ (goal) ∀ (path)

Sophie hat Michael in jedes Land geschrieben über mindestens eine Stadt.

∀ (goal) ∃ (path)
∃ (path) ∀ (goal)

A.1.12.10.3 Pair-List Reading

In welches Land schrieb sie ihm über jede Stadt?

→ Über welche Stadt schrieb sie ihm in jedes Land?

Result (PLR)

Goal > Path

A.1.12.10.4 Informational Focus

Sophie hat Michael über Rom nach Kolumbien geschrieben.
Sophie has Michael over Rome to Columbia written.
'Sophie wrote a letter to Michael, sending it over Rome to Columbia.'

Wohin hat Sophie ihm über Rom geschrieben?
Sie hat ihm über Rom nach Kolumbien geschrieben.
Sie hat nach Kolumbien ihm über Rom geschrieben.

Über welche Stadt hat Sophie ihm nach Kolumbien geschrieben?
Sie hat ihm über Rom nach Kolumbien geschrieben.
Sie hat ihm nach Kolumbien über Rom geschrieben.

Result (IF)

(0,1) Goal > Path

A.1.12.11 Path – Source

A.1.12.11.1 Quantifier Scope

Hans had to return from the different towns to Mainz. And as we might have suspected, he used to take different routes too.

Hans ist von mindestens einer Stadt über jedes Dorf gefahren
Hans is from at least one town over every village gone.
'Hans drove through every village from at least one town.'

Hans ist von mindestens einer Stadt über jedes Dorf nach Mainz gefahren.
∃ (source) ∀ (path)
∀ (path) ∃ (source)
Hans ist über mindestens ein Dorf von jeder Stadt nach Mainz gefahren.
\( \exists (\text{path}) \ \forall (\text{source}) \)
\( \forall (\text{source}) \ \exists (\text{path}) \)

Hans ist über jedes Dorf von mindestens einer Stadt nach Mainz gefahren.
\( \forall (\text{path}) \ \exists (\text{source}) \)
\( \exists (\text{source}) \ \forall (\text{path}) \)

Hans ist von jeder Stadt über mindestens ein Dorf nach Mainz gefahren.
\( \forall (\text{source}) \ \exists (\text{path}) \)
\( ? \ \exists (\text{path}) \ \forall (\text{source}) \)

Result (QS)

(0.5,1,0,0,0,0) Source > Path

A.1.12.11.2 Nachfeld

Hans ist von mindestens einer Stadt nach Mainz gefahren über jedes Dorf.
\( \exists (\text{source}) \ \forall (\text{path}) \)
\( * \ \forall (\text{path}) \ \exists (\text{source}) \)

Hans ist über mindestens ein Dorf nach Mainz gefahren von jeder Stadt.
\( * \ \exists (\text{path}) \ \forall (\text{source}) \)
\( \forall (\text{source}) \ \exists (\text{path}) \)

Hans ist über jedes Dorf nach Mainz gefahren von mindestens einer Stadt.
\( * \ \forall (\text{path}) \ \exists (\text{source}) \)
\( \exists (\text{source}) \ \forall (\text{path}) \)

Hans ist von jeder Stadt nach Mainz gefahren über mindestens ein Dorf.
\( \forall (\text{source}) \ \exists (\text{path}) \)
\( ?? \ \exists (\text{path}) \ \forall (\text{source}) \)

A.1.12.11.3 Pair-List Reading

Von welcher Stadt ist er über jedes Dorf nach Mainz gefahren?

→ Über welches Dorf ist er von jeder Stadt nach Mainz gefahren?

Result (PLR)

Source > Path

A.1.12.11.4 Informational Focus

Hans ist von Koblenz über Bingen (nach Mainz) gefahren.
Hans is from Koblenz over Bingen (to Mainz) gone.
'Hans drove from Koblenz through Bingen (to Mainz).'
Woher ist Hans über Bingen gefahren?
Er ist von Koblenz über Bingen gefahren.
Er ist über Bingen von Koblenz gefahren.

Über welches Dorf ist Hans von Koblenz gefahren?
Er ist von Koblenz über Bingen gefahren.
? Er ist über Bingen von Koblenz gefahren.

Result (IF)

(0.5,0) Source > Path

A.1.13 Malefaktiv ("gegen")

A.1.13.1 Malefactive – Temporal

A.1.13.1.1 Quantifier Scope

Michael is a professional racing driver. Bob, Mika and Jack were his most dangerous competitors. They were "THE competitors" the others didn't count. His goal was to win against all of them, but very rarely they were all on the same race.

Michael ist in mindestens einer Woche gegen jeden Rivalen gefahren.
'Michael raced against every rival in at least one week.'

Michael ist gegen mindestens einen Rivalen in jeder Woche gefahren.
∀ (time) ∃ (opponent)

Michael ist in jeder Woche gegen mindestens einen Rivalen gefahren.
∀ (time) ∃ (opponent)

Result (QS)

(1,3,0,0,1,1) Temporal > Malefactive
A.1.13.1.2 Pair-List Reading

→ Gegen welchen Rivalen ist Michael in jeder Woche gefahren?

In welcher Woche ist Michael gegen jeden Rivalen gefahren?

Result (PLR)

Temporal > Malefactive

A.1.13.1.3 Informational Focus

Michael ist am Dienstag gegen Ralph gefahren.
Michael is on Tuesday against Ralph driven
'Michael raced against Ralph on Tuesday.'

Gegen wen ist Michael am Dienstag gefahren?
Er ist am Dienstag gegen Ralph gefahren
* Er ist gegen Ralph am Dienstag gefahren

Wann ist Michael gegen Ralph gefahren?
Er ist gegen Ralph am Dienstag gefahren
Er ist am Dienstag gegen Ralph gefahren

Result (IF)

(3,1) Temporal > Malefactive

A.1.13.2 Malefactive – Benefactive

A.1.13.2.1 Quantifier Scope

In his long career Michael changed several times the company for which he made the races, but the competitors remained.

Michael ist für mindestens eine Firma gegen jeden Rivalen gefahren.
Michael is for at least one company against every competitor driven
'Michael raced against every competitor for at least one company.'

Michael ist für mindestens eine Firma gegen jeden Rivalen gefahren.
∃ (beneficiary) ∀ (opponent)
?
∀ (opponent) ∃ (beneficiary)

Michael ist gegen mindestens einen Rivalen für jede Firma gefahren.
∃ (opponent) ∀ (beneficiary)
∀ (beneficiary) ∃ (opponent)

Michael ist gegen jeden Rivalen für mindestens eine Firma gefahren.
∀ (opponent) ∃ (beneficiary)
∃ (beneficiary) ∀ (opponent)
Michael ist für jede Firma gegen mindestens einen Rivalen gefahren.
∀ (beneficiary) ∃ (opponent)
∨ (beneficiary) ∀ (beneficiary) ∃ (opponent)

Result (QS)

(1,1,0,0,0,0) Benefactive > Malefactive

A.1.13.2.2 Pair-List Reading

Für welche Firma ist Michael gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Michael für jede Firma gefahren?

Result (PLR)

Benefactive > Malefactive

A.1.13.2.3 Informational Focus

Michael ist für Ferrari gegen Ralph gefahren.
Michael is for Ferrari against Ralph driven
'Michael raced against Ralph for Ferrari,'

Für wen ist Michael gegen Ralph gefahren?
Er ist für Ferrari gegen Ralph gefahren.
Er is gegen Ralph für Ferrari gefahren.
Gegen wen ist Michael für Ferrari gefahren?
Er ist für Ferrari gegen Ralph gefahren.
* Er ist gegen Ralph für Ferrari gefahren.

Result (IF)

(3,1) Benefactive > Malefactive

A.1.13.3 Malefactive – Reason

A.1.13.3.1 Quantifier Scope
Michael war sehr gierig, um jeden Preis zu gewinnen, der im Feld verfügbar war, aber er hatte keine Zeit, für jeden Preis zu rennen. Um den Grand Prix von Monaco zu gewinnen, musste er gegen jeden Konkurrenten fahren, aber für andere Preise war dies nicht möglich.

Michael ist wegen mindestens einem Preis gegen jeden Rivalen gefahren.
Michael is because of at least one prize against every competitor driven
'Michael raced against every competitor because of at least one prize.'

Michael ist wegen mindestens einem Preis gegen jeden Rivalen gefahren.
∃ (reason) ∀ (opponent)
∨ (opponent) ∃ (reason)
Michael ist gegen mindestens einen Rivalen wegen jedem Preis gefahren.
∃ (opponent) ∀ (reason)
∀ (reason) ∃ (opponent)

Michael ist gegen jeden Rivalen wegen mindestens einem Preis gefahren.
∀ (opponent) ∃ (reason)
∃ (reason) ∀ (opponent)

Michael ist wegen jedem Preis gegen mindestens einen Rivalen gefahren.
∀ (reason) ∃ (opponent)
∃ (opponent) ∀ (reason)

Nachfeld

Dass Michael wegen mindestens einem Preis gefahren ist gegen jeden Rivalen, stand in der Zeitung.
∃ (reason) ∀ (opponent)
∀ (opponent) ∃ (reason)

Dass Michael gegen mindestens einen Rivalen gefahren ist wegen jedem Preis, stand in der Zeitung.
?? ∃ (opponent) ∀ (reason)
∀ (reason) ∃ (opponent)

Dass Michael gegen jeden Rivalen gefahren ist wegen mindestens einem Preis, stand in der Zeitung.
? ∀ (opponent) ∃ (reason)
∃ (reason) ∀ (opponent)

Dass Michael wegen jedem Preis gefahren ist gegen mindestens einen Rivalen, stand in der Zeitung.
∀ (reason) ∃ (opponent)
∃ (opponent) ∀ (reason)

Result (QS)

(1,2,0,0,0,0) + 1 Reason > Malefactive

A.1.13.3.2 Pair-List Reading

Wegen welchem Preis ist Michael gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Michael wegen jedem Preis gefahren?

Result (PLR)

Reason > Malefactive
A.1.13.3 Informational Focus

Michael ist wegen dem großen Preis von Monte-Carlo gegen Ralph gefahren. 'Michael raced against Ralph because of the Grand Prix of Monte-Carlo.'


A.1.13.4 Malefactive – Locative

A.1.13.4.1 Quantifier Scope

Michael ist auf mindestens einer Rennstrecke gegen jeden Rivalen gefahren. 'Michael raced against every competitor on at least one racetrack.'

Michael ist auf mindestens einer Rennstrecke gegen jeden Rivalen gefahren.  
\[ \exists (\text{place}) \ \forall (\text{opponent}) \]

Michael ist gegen mindestens einen Rivalen auf jeder Rennstrecke gefahren.  
\[ \exists (\text{opponent}) \ \forall (\text{place}) \]

Michael ist gegen jeden Rivalen auf mindestens einer Rennstrecke gefahren.  
\[ \forall (\text{opponent}) \ \exists (\text{place}) \]

Michael ist auf jeder Rennstrecke gegen mindestens einen Rivalen gefahren.  
\[ \forall (\text{place}) \ \exists (\text{opponent}) \]

Result (QS)

(1,2,0,0,0,0) Locative > Malefactive

A.1.13.4.2 Pair-List Reading

Auf welcher Rennstrecke ist Michael gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Michael auf jeder Strecke gefahren?
Result (PLR)

Locative > Malefactive

A.1.13.4.3 Informational Focus

Michael ist auf dem Nürburgring gegen Ralph gefahren.
Michael is on the Nürburgring against Ralph driven
'Michael raced against Ralph on the Nürburgring.'

Wo ist Michael gegen Ralph gefahren?
Er ist auf dem Nürburgring gegen Ralph gefahren.
Er ist gegen Ralph auf dem Nürburgring gefahren.

Gegen wen ist Michael auf dem Nürburgring gefahren?
Er ist auf dem Nürburgring gegen Ralph gefahren.
?? Er ist gegen Ralph auf dem Nürburgring gefahren.

Result (IF)

(2,1) Locative > Malefactive

A.1.13.5 Malefactive – Instrumental

A.1.13.5.1 Quantifier Scope

Ferrari is developing a new gearshift. Michael had to test several prototypes in his races.

Michael ist mit mindestens einer Gangschaltung gegen jeden Rivalen gefahren.
Michael is with at least one type of gears against every competitor driven
'Michael raced against every competitor with at least one type of gears.'

Michael ist mit mindestens einer Gangschaltung gegen jeden Rivalen gefahren.
∃ (instrument) ∀ (opponent)
∀ (opponent) ∃ (instrument)

Michael ist gegen mindestens einen Rivalen mit jeder Gangschaltung gefahren.
∃ (opponent) ∀ (instrument)
? ∀ (instrument) ∃ (opponent)

Michael ist gegen jeden Rivalen mit mindestens einer Gangschaltung gefahren.
∀ (opponent) ∃ (instrument)
? ∃ (instrument) ∀ (opponent)

Michael ist mit jeder Gangschaltung gegen mindestens einen Rivalen gefahren.
∀ (instrument) ∃ (opponent)
∃ (opponent) ∀ (instrument)
Result (QS)

\((1,1,0,0,0,0)\) Malefactive > Instrumental

A.1.13.5.2 Pair-List Reading

Gegen welchen Rivalen ist Michael mit jeder Gangschaltung gefahren?

→ Mit welcher Gangschaltung ist Michael gegen jeden Rivalen gefahren?

Result (PLR)

Malefactive > Instrumental

A.1.13.5.3 Informational Focus

Michael ist gegen Ralph mit der Shimano-Schaltung gefahren.
Michael is against Ralph with the Shimano gears driven
'Michael raced with the Shimano gears against Ralph.'

Mit welcher Gangschaltung ist Michael gegen Ralph gefahren?
Er ist gegen Ralph \textit{mit der Shimano-Schaltung} gefahren.
? Er ist \textit{mit der Shimano-Schaltung} gegen Ralph gefahren.

Gegen wen ist Michael mit der Shimano-Schaltung gefahren?
Er ist \textit{gegen Ralph} mit der Shimano-Schaltung gefahren.
Er ist mit der Shimano-Schaltung \textit{gegen Ralph} gefahren.

Result (IF)

\((1,0)\) Malefactive > Instrumental

A.1.13.6 Malefactive – Manner

A.1.13.6.1 Quantifier Scope

Michael tried different ways of driving with his new car: The first way was driving carefully and overtaking only in curves. The second was driving fast in the beginning, overtaking as many as he could make. The third way was the very risky way of ramming his opponents without getting killed.

Michael ist auf mindestens eine Art gegen jeden Rivalen gefahren.
Michael is in at least one manner against every competitor driven
'Michael raced against every competitor in at least one manner.'

Michael ist auf mindestens eine Art gegen jeden Rivalen gefahren.
∃ (manner) ∀ (opponent)

∀ (opponent) ∃ (manner)

Michael ist gegen mindestens einen Rivalen auf jede Art gefahren.
∃ (opponent) ∀ (manner)
?? ∀ (manner) ∃ (opponent)
Michael ist gegen jeden Rivalen auf mindestens eine Art gefahren.
\[\forall (\text{opponent}) \exists (\text{manner})\]
\[\exists (\text{manner}) \forall (\text{opponent})\]

Michael ist auf jede Art gegen mindestens einen Rivalen gefahren.
\[\forall (\text{manner}) \exists (\text{opponent})\]
\[\exists (\text{opponent}) \forall (\text{manner})\]

Result (QS)

(2,3,0,0,0,0) Malefactive > Manner

A.1.13.6.2 Pair-List Reading

→ Auf welcher Art ist Michael gegen jeden Rivalen gefahren?

Gegen welchen Rivalen ist Michael auf jede Art gefahren?

Result (PLR)

Malefactive > Manner

A.1.13.6.3 Informational Focus

In his team were five other world-class drivers that fought with him against the competitors.

Michael ist mit mindestens einem Kollegen gegen jeden Rivalen gefahren.
Michael is with at least one colleague against every competitor driven
'Michael raced against every competitor with at least one colleague.'
Michael ist mit mindestens einem Kollegen gegen jeden Rivalen gefahren.
\[ \exists \text{(comitative)} \forall \text{(opponent)} \]
\[ ? \forall \text{(opponent)} \exists \text{(comitative)} \]

Michael ist gegen mindestens einen Rivalen mit jedem Kollegen gefahren.
\[ \exists \text{(opponent)} \forall \text{(comitative)} \]
\[ \forall \text{(comitative)} \exists \text{(opponent)} \]

Michael ist gegen jeden Rivalen mit mindestens einem Kollegen gefahren.
\[ \forall \text{(opponent)} \exists \text{(comitative)} \]
\[ \exists \text{(comitative)} \forall \text{(opponent)} \]

Michael ist mit jedem Kollegen gegen mindestens einen Rivalen gefahren.
\[ \forall \text{(comitative)} \exists \text{(opponent)} \]
\[ ?\exists \text{(opponent)} \forall \text{(comitative)} \]

Result (QS)

(1,2,0,0,0,0) Comitative > Malefactive

A.1.13.7.2 Pair-List Reading

Mit welchem Kollegen ist Michael gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Michael mit jedem Kollegen gefahren?

Result (PLR)

Comitative > Malefactive

A.1.13.7.3 Informational Focus

Michael ist mit Rubens gegen Ralph gefahren.
Michael is with Rubens against Ralph driven
'Michael raced against Ralph with Rubens.'

Mit wem ist Michael gegen Ralph gefahren?

Er ist mit Rubens gegen Ralph gefahren.
Er ist gegen Ralph mit Rubens gefahren.

Gegen wen ist Michael mit Rubens gefahren?

Er ist mit Rubens gegen Ralph gefahren.

? Er ist gegen Ralph mit Rubens gefahren.

Result (IF)

(1,1) Comitative > Malefactive
A.1.13.8 Malefactive – Evidential

A.1.13.8.1 Quantifier Scope

Years later a young student wrote an article about Michaels career. In the library he looked through various newspapers to find out where, when and against whom Michael won or lost his races.

\[\text{Michael ist gemäß mindestens eines Journalisten gegen jeden Rivalen gefahren.}\]
\[\text{Michael is according at least one journalist against every competitor driven}\]

'According at least one journalist, Michael raced against every competitor.'

\[\exists \text{ (witness)} \; \forall \text{ (opponent)}\]

\[?? \; \forall \text{ (opponent)} \; \exists \text{ (witness)}\]

Michael ist gegen mindestens einen Rivalen gemäß jedem Journalisten gefahren.
\[\exists \text{ (opponent)} \; \forall \text{ (witness)}\]
\[\forall \text{ (witness)} \; \exists \text{ (opponent)}\]

Michael ist gegen jeden Rivalen gemäß mindestens eines Journalisten gefahren.
\[\forall \text{ (opponent)} \; \exists \text{ (witness)}\]
\[\exists \text{ (witness)} \; \forall \text{ (opponent)}\]

Michael ist gegen jeden Rivalen gemäß jedem Journalisten gefahren.
\[\forall \text{ (witness)} \; \exists \text{ (opponent)}\]
\[*\; \exists \text{ (opponent)} \; \forall \text{ (witness)}\]

Result (QS)

\[(2,3,0,0,1,1)\; \text{Evidential > Malefactive}\]

A.1.13.8.2 Pair-List Reading

→ Gegen welchen Rivalen ist Michael gemäß jedem Journalisten gefahren?

Gemäß welchem Journalisten ist Michael gegen jeden Rivalen gefahren?

Result (PLR)

Evidential > Malefactive

A.1.13.8.3 Informational Focus

Michael ist gemäß Marcel gegen Ralph gefahren.
Michael is according Marcel against Ralph driven
'According Marcel, Michael raced against Ralph.'

Gegen wen ist Michael gemäß Marcel gefahren?
Michael ist gemäß Marcel gegen Ralph gefahren.
? Michael ist gegen Ralph gemäß Marcel gefahren.
Gemäß wem ist Michael gegen Ralph gefahren?
Michael ist gemäß Marcel gegen Ralph gefahren.
Michael ist gegen Ralph gemäß Marcel gefahren.

Result (IF)

(1,1) Evidential > Malefactive

A.1.13.9 Malefactive – Matter

A.1.13.9.1 Quantifier Scope

Fritz, the young journalist wrote about different racing drivers. His articles were directed at various anti racing activists.

Fritz hat über mindestens einen Rennfahrer gegen jeden Aktivisten geschrieben.
Fritz has about at least one racing driver against every activist written
'Fritz wrote against every activist about at least one racing driver.'

Fritz hat über mindestens einen Rennfahrer gegen jeden Aktivisten geschrieben.
∃ (matter) ∀ (opponent)
∀ (opponent) ∃ (matter)

Fritz hat gegen mindestens einen Aktivisten über jeden Rennfahrer geschrieben.
∃ (opponent) ∀ (matter)
?? ∀ (matter) ∃ (opponent)

Fritz hat gegen jeden Aktivisten über mindestens einen Rennfahrer geschrieben.
∀ (opponent) ∃ (matter)
* ∃ (matter) ∀ (opponent)

Fritz hat über jeden Rennfahrer gegen mindestens einen Aktivisten geschrieben.
∀ (matter) ∃ (opponent)
∃ (opponent) ∀ (matter)

Result (QS)
The sentences are semantically very hard to judge.

(2,3,0,0,0,0) Malefactive > Matter

A.1.13.9.2 Pair-List Reading

→ Über welchen Rennfahrer hat Fritz gegen jeden Aktivisten geschrieben?

Gegen welchen Aktivisten hat Fritz über jeden Rennfahrer geschrieben?

Result (PLR)

Malefactive > Matter
A.1.13.9.3 Informational Focus

Er hat gegen Hannelore über Michael geschrieben.
He has against Hannelore about Michael written
'H he wrote about Michael against Hannelore.'

Gegen wen hat Fritz über Michael geschrieben?
Er hat über Michael gegen Hannelore geschrieben.
Er hat gegen Hannelore über Michael geschrieben.

Über wen hat Fritz gegen Hannelore geschrieben?
Er hat über Michael gegen Hannelore geschrieben.
Er hat gegen Hannelore über Michael geschrieben.

Result (IF)

(1,1) Malefactive > Matter

A.1.13.10 Malefactive – Goal

A.1.13.10.1 Quantifier Scope

Fritz wrote several articles against various politicians and sent them into all European capitals.

Fritz hat in mindestens eine Hauptstadt gegen jeden Regierungschef geschrieben.
Fritz has in at least one capital against every head of government written
'The wrote against head of government in at least one capital.'

Fritz hat in mindestens eine Hauptstadt gegen jeden Regierungschef geschrieben.
∃ (goal) ∀ (opponent)
?
∀ (opponent) ∃ (goal)

Fritz hat gegen mindestens einen Regierungschef in jede Hauptstadt geschrieben.
∃ (opponent) ∀ (goal)
∀∃ (goal) (opponent)

Fritz hat gegen jeden Regierungschef in mindestens eine Hauptstadt geschrieben.
∀ (opponent) ∃ (goal)
?
∃ (goal) ∀ (opponent)

Fritz hat in jede Hauptstadt gegen mindestens einen Regierungschef geschrieben.
∀ (goal) ∃ (opponent)
∃ (opponent) ∀ (goal)

Result (QS)

(1,1,0,0,0,0) Goal > Malefactive
A.13.10.2 Pair-List Reading

In welche Hauptstadt hat Fritz gegen jeden Regierungschef geschrieben?

→ Gegen welchen Regierungschef hat Fritz in jede Hauptstadt geschrieben?

Result (PLR)

Goal > Malefactive

A.13.10.3 Informational Focus

Fritz hat nach Zagreb gegen Milosevic geschrieben.
Fritz has to Zagreb against Milosevic written
Fritz wrote against Milosevic to Zagreb.

Wohin hat Fritz gegen Milosevic geschrieben?
Fritz hat gegen Milosevic nach Zagreb geschrieben.
Fritz hat nach Zagreb gegen Milosevic geschrieben.

Gegen wen hat Fritz nach Zagreb geschrieben?
Fritz hat gegen Milosevic nach Zagreb geschrieben.
Fritz hat nach Zagreb gegen Milosevic geschrieben.

Result (IF)

(1,0) Goal > Malefactive

A.13.11 Malefactive – Source

A.13.11.1 Quantifier Scope

Michael ist von mindestens einem Startpunkt gegen jeden Gegner gefahren.
Michael is from at least one starting point against every competitor driven
'Michael raced against every competitor from at least one starting point.'

Michael ist von mindestens einem Startpunkt gegen jeden Gegner gefahren.
∃ (source) ∀ (opponent)

Michael ist gegen mindestens einen Gegner von jedem Startpunkt (aus) gefahren.
∃ (opponent) ∀ (source)
∀ (source) ∃ (opponent)

Michael ist gegen jeden Gegner von mindestens einem Startpunkt gefahren.
∀ (opponent) ∃ (source)
∃ (source) ∀ (opponent)

Michael ist von jedem Startpunkt gegen mindestens einen Gegner gefahren.
∀ (source) ∃ (opponent)
∃ (opponent) ∀ (source)
Fritz hat aus mindestens einer Hauptstadt gegen jeden Regierungschef geschrieben.
∃ (source) ∀ (opponent)
? ∀ (opponent) ∃ (goal)

Fritz hat gegen mindestens einen Regierungschef aus jeder Hauptstadt geschrieben.
∃ (opponent) ∀ (source)
∀∃ (source) (opponent)

Fritz hat gegen jeden Regierungschef aus mindestens einer Hauptstadt geschrieben.
∀ (opponent) ∃ (source)
∃ (source) ∀ (opponent)

Fritz hat aus jeder Hauptstadt gegen mindestens einen Regierungschef geschrieben.
∀ (source) ∃ (opponent)
? ∃ (opponent) ∀ (source)

Result (QS)
(1,1,0,0,0,0) Source > Malefactive

A.1.13.11.2 Pair-List Reading

Aus welcher Stadt hat Fritz gegen jeden Regierungschef geschrieben?
→ Gegen welchen Regierungschef hat Fritz aus jeder Stadt geschrieben?

Result (PLR)
Source > Malefactive

A.1.13.11.3 Informational Focus

Fritz hat aus Belgrad gegen Milosevic geschrieben.
Fritz has from Belgrad against Milosevic written
'Fritz wrote against Milosevic from Belgrad.'

Aus welcher Stadt hat Fritz gegen Milosevic geschrieben?
Fritz hat aus Belgrad gegen Milosevic geschrieben.
Fritz hat gegen Milosevic aus Belgrad geschrieben.

Gegen wen hat Fritz aus Belgrad geschrieben?
Fritz hat aus Belgrad gegen Milosevic geschrieben.
? Fritz hat gegen Milosevic aus Belgrad geschrieben.

Result (IF)
(1,1) Source > Malefactive
A.1.13.12 Malefactive – Path

A.1.13.12.1 Quantifier Scope

Michael ist über mindestens eine Strecke gegen jeden Rivalen gefahren.
Michael is over at least one route against every competitor driven
'Michael raced against every competitor taking one route.'

Michael ist über mindestens eine Strecke gegen jeden Rivalen gefahren.
∃ (path) ∀ (opponent)
∀ (opponent) ∃ (path)

Michael ist gegen mindestens einen Rivalen über jede Strecke gefahren.
∃ (opponent) ∀ (path)
∀ (path) ∃ (opponent)

Michael ist gegen jeden Rivalen über mindestens eine Strecke gefahren.
∀ (opponent) ∃ (path)
? ∃ (path) ∀ (opponent)

Michael ist über jede Strecke gegen mindestens einen Rivalen gefahren.
∀ (path) ∃ (opponent)
∃ (opponent) ∀ (path)

Result (QS)

(0,1,0,0,0,0) Malefactive > Path

A.1.13.12.2 Pair-List Reading

→ Über welcher Strecke ist Michael gegen jeden Rivalen gefahren?
Gegen welchen Rivalen ist Michael über jede Strecke gefahren?

Result (PLR)

Malefactive > Path

A.1.13.12.3 Informational Focus

Michael ist gegen Ralph über die A9 gefahren.
Michael is against Ralph over the A9 (free way) driven
'Michael raced against Ralph, taking the A9.'

Über welche Strecke ist Michael gegen Ralph gefahren?
Michael ist gegen Ralph über die A9 gefahren.
?? Michael ist über die A9 gegen Ralph gefahren.
Gegen wen ist Michael über die A9 gefahren?
Michael ist gegen Ralph über die A9 gefahren.
Michael ist über die A9 gegen Ralph gefahren.

Result (IF)

(2,0) Malefactive > Path

A.1.14 Means (of Transportation)

A.1.14.1 Means – Temporal

A.1.14.1.1 Quantifier Scope

Klaus ist an mindestens einem Tag mit jedem Wagen gefahren.
Klaus is on at least one day with every car driven
'Klaus travelled with every car on at least one day.'

Klaus ist an mindestens einem Tag mit jedem Wagen gefahren.
∃ (time) ∀ (means)
?? ∀ (means) ∃ (time)

Klaus ist mit mindestens einem Wagen an jedem Tag gefahren.
∃ (means) ∀ (time)
∀ (time) ∃ (means)

Klaus ist mit jedem Wagen an mindestens einem Tag gefahren.
∀ (means) ∃ (time)
∃ (time) (means)

Klaus ist an jedem Tag mit mindestens einem Wagen gefahren.
∀ (time) ∃ (means)
?? ∃ (means) ∀ (time)

Result (QS)

(2,2,0,0,1,0) Temporal > Means

A.1.14.1.2 Pair-List Reading

→ Mit welchem Wagen ist Klaus an jedem Tag gefahren?

An welchem Tag ist Klaus mit jedem Wagen gefahren?

Result (PLR)

Temporal > Means
A.1.14.1.3 Informational Focus

Klaus ist am Mittwoch mit dem roten Porsche gefahren.

Klaus is on Wednesday with the red Porsche driven
'Klaus went with the red Porsche on Wednesday.'

Mit welchem Wagen ist Klaus am Mittwoch gefahren?
Klaus ist am Mittwoch mit dem roten Porsche gefahren.

Wann ist Klaus mit dem roten Porsche gefahren?
Klaus ist am Mittwoch mit dem roten Porsche gefahren.

Result (IF)

(1,1) Temporal > Means

A.1.14.2 Means – Benefactive

A.1.14.2.1 Quantifier Scope

Klaus ist für mindestens eine Firma mit jedem Wagen gefahren.
Klaus is for at least one company with every car driven
'Klaus travelled with every car for at least one company.'

Klaus ist für mindestens eine Firma mit jedem Wagen gefahren.
∃ (beneficiary) ∀ (means)

? ∀ (means) ∃ (beneficiary)

Klaus ist mit mindestens einem Wagen für jede Firma gefahren.
∃ (means) ∀ (beneficiary)

∀ (beneficiary) ∃ (means)

Klaus ist mit jedem Wagen für mindestens eine Firma gefahren.
∀ (means) ∃ (beneficiary)

∃ (beneficiary) ∀ (means)

Klaus ist für jede Firma mit mindestens einem Wagen gefahren.
∀ (beneficiary) ∃ (means)

? ∃ (means) ∀ (beneficiary)

Result (QS)

(1,1,0,0,0,0) Benefactive > Means

A.1.14.2.2 Pair-List Reading

Für welche Firma ist Klaus mit jedem Wagen gefahren?

→ Mit welchem Wagen ist Klaus für jede Firma gefahren?
Result (PLR)

Benefactive > Means

A.1.14.2.3 Informational Focus

Klaus ist für die Spekulatius-Spedition mit dem grünen Lastwagen gefahren.
Klaus is for the "Spekulatius" haulage company with the green truck driven
'Klaus went with the green truck for the "Spekulatius" haulage company.'

Für welche Firma ist Klaus mit dem grünen Lastwagen gefahren?
Klaus ist mit dem grünen Lastwagen für die Spekulatius-Spedition gefahren.
Klaus is für die Spekulatius-Spedition mit dem grünen Lastwagen gefahren.

Mit was ist Klaus für die Spekulatius-Spedition gefahren?
? Klaus ist mit dem grünen Lastwagen für die Spekulatius-Spedition gefahren.
Klaus ist für die Spekulatius-Spedition mit dem grünen Lastwagen gefahren.

Result (IF)

(1,1) Benefactive > Means

A.1.14.3 Means – Reason

A.1.14.3.1 Quantifier Scope

Klaus ist wegen mindestens einem Auftrag mit jedem Wagen gefahren.
Klaus is because of at least one order with every car driven
'Klaus travelled with every car because of at least one order.'

Klaus ist wegen mindestens einem Auftrag mit jedem Wagen gefahren.
∃ (reason) ∀ (means)
∀ (means) ∃ (reason)

Klaus ist mit mindestens einem Wagen wegen jedem Auftrag gefahren.
∃ (means) ∀ (reason)
∀ (reason) ∃ (means)

Klaus ist mit jedem Wagen wegen mindestens einem Auftrag gefahren.
∀ (means) ∃ (reason)
∃ (reason) ∀ (means)

Klaus ist wegen jedem Auftrag mit mindestens einem Wagen gefahren.
∀ (reason) (means)
? ∃ (means) ∀ (reason)

Result (QS)

(0,1,0,0,0) Reason > Means
A.1.14.3.2   Pair-List Reading

→ Mit welchem Wagen ist Klaus wegen jedem Auftrag gefahren?

   Wegen welchem Auftrag ist Klaus mit jedem Wagen gefahren?

Result (PLR)

Reason > Means

A.1.14.3.3   Informational Focus

Klaus ist wegen der Hühnerlieferung mit dem Porsche gefahren.
Klaus is because of the chicken delivery with the Porsche driven
'Klaus went with the Porsche because of the chicken delivery.'

Mit welchem Wagen ist Klaus wegen der Hühnerlieferung gefahren?
Klaus ist mit dem Porsche wegen der Hühnerlieferung gefahren.
Klaus is wegen der Hühnerlieferung mit dem Porsche gefahren.

Wegen welchem Auftrag ist Klaus mit dem Porsche gefahren?
Klaus ist mit dem Porsche wegen der Hühnerlieferung gefahren.
Klaus is wegen der Hühnerlieferung mit dem Porsche gefahren.

Result (IF)

(0,1)   Reason > Means

A.1.14.4   Means – Locative

A.1.14.4.1   Quantifier Scope

Klaus ist in mindestens einem Land mit jedem Auto gefahren.
Klaus is in at least one country with every car driven
'Klaus travelled with every car in at least one country.'

Klaus ist in mindestens einem Land mit jedem Auto gefahren.
∃ (place) ∀ (means)

? ∀ (means) ∃ (place)

Klaus ist mit mindestens einem Auto in jedem Land gefahren.
∃ (means) ∀ (place)

∀ (place) ∃ (means)

Klaus ist mit jedem Auto in mindestens einem Land gefahren.
∀ (means) ∃ (place)

∃ (place) ∀ (means)

Klaus ist in jedem Land mit mindestens einem Auto gefahren.
∀ (place) ∃ (means)

?? ∃ (means) ∀ (place)
Result (QS)

(1,2,0,0,0,0) Locative > Means

A.1.14.4.2 Pair-List Reading

In welchem Land ist Klaus mit jedem Wagen gefahren?

→ Mit welchem Wagen ist Klaus in jedem Land gefahren?

Result (PLR)

Locative > Means

A.1.14.4.3 Informational Focus

Klaus ist in England mit dem Jaguar gefahren.
Klaus is in England with the Jaguar driven
'Klaus went with the Jaguar in England.'

In welchem Land ist Klaus mit dem Jaguar gefahren?

Klaus ist in England mit dem Jaguar gefahren.
Klaus is in England with the Jaguar driven
'Klaus went with the Jaguar in England.'

Womit ist Klaus in England gefahren?

Klaus ist in England mit dem Jaguar gefahren.
Klaus is in England with the Jaguar driven
'Klaus went with the Jaguar in England.'

Result (IF)

(2,1) Locative > Means

A.1.14.5 Means – Instrumental

A.1.14.5.1 Quantifier Scope

? Klaus ist mit mindestens einer Gangschaltung mit jedem Fahrrad gefahren.
Klaus is with at least one type of gears with every bicycle driven
'Klaus travelled with every bicycle with at least one type of gears.'

? Klaus ist mit mindestens einer Gangschaltung mit jedem Fahrrad gefahren.
∃ (instrument) ∀ (means)
∀ (means) ∃ (instrument)

? Klaus ist mit mindestens einem Fahrrad mit jeder Gangschaltung gefahren.
∃ (means) ∀ (instrument)
? ∀ (instrument) ∃ (means)

? Klaus ist mit jedem Fahrrad mit mindestens einer Gangschaltung gefahren.
∀ (means) ∃ (instrument)
? ∃ (instrument) ∀ (means)
Klaus ist mit jeder Gangschaltung mit mindestens einem Fahrrad gefahren.
∀ (instrument) ∃ (means)
∃ (means) ∀ (instrument)

Result (QS)

(1,1,0,0,0,0) Means > Instrumental?

A.1.14.5.2 Pair-List Reading

Mit welcher Gangschaltung ist Klaus mit jedem Wagen gefahren?

Mit welchem Wagen ist Klaus mit jeder Gangschaltung gefahren?

Result (PLR)

Means ? Instrumental

A.1.14.5.3 Informational Focus

* Michael ist mit dem neuen Lenkrad mit dem Ferrari gefahren.
  Michael is with the new steering-wheel with the Ferrari driven
  'Michael went the Ferrari with the new steering wheel.'

* Mit welchem Lenkrad ist Michael mit dem Ferrari gefahren?
* Michael ist mit dem neuen Lenkrad mit dem Ferrari gefahren.
* Michael ist mit dem Ferrari mit dem neuen Lenkrad gefahren.

* Mit welchem Wagen ist Michael mit dem neuen Lenkrad gefahren?
* Michael ist mit dem neuen Lenkrad mit dem Ferrari gefahren.
* Michael ist mit dem Ferrari mit dem neuen Lenkrad gefahren.

The question and the answers sound odd independent of the focus properties. Obviously you cannot have both elements in one sentence.

Result (IF)

(0,0) Means ? Instrument

A.1.14.6 Means – Manner

A.1.14.6.1 Quantifier Scope

Klaus ist auf mindestens eine Art mit jedem Wagen gefahren.
Klaus is in at least one way with every car driven
'Klaus travelled with every car in at least one way.'

Klaus ist auf mindestens eine Art mit jedem Wagen gefahren.
∃ (manner) ∀ (means)
∀ (means) ∃ (manner)
Klaus ist mit mindestens einem Wagen auf jede Art gefahren.
∃ (means) ∀ (manner)

Klaus ist mit jedem Wagen auf mindestens eine Art gefahren.
∀ (means) ∃ (manner)

Klaus ist auf jede Art mit mindestens einem Wagen gefahren.
∀ (manner) ∃ (means)
∃ (means) ∀ (manner)

Result (QS)

(1,2,0,0,1,0) Means > Manner

A.1.14.6.2 Pair-List Reading

→ Auf welche Art ist Klaus mit jedem Wagen gefahren?
Mit welchem Wagen ist Klaus auf jede Art gefahren?

Result (PLR)

Means > Manner

A.1.14.6.3 Informational Focus

Michael ist mit dem Ferrari auf rasante Art gefahren.
Michael is with the Ferrari in a fast manner driven
'Michael went with the Ferrari with high speed.'

Auf welche Art ist Michael mit dem Ferrari gefahren?
?? Michael ist auf rasante Art mit dem Ferrari gefahren.
Michael ist mit dem Ferrari auf rasante Art gefahren.
Womit ist Michael auf rasante Art gefahren?
Michael ist auf rasante Art mit dem Ferrari gefahren.
Michael ist mit dem Ferrari auf rasante Art gefahren.

Result (IF)

(2,0) Means > Manner

A.1.14.7 Means – Comitative

A.1.14.7.1 Quantifier Scope

Klaus ist mindestens einem Freund mit jedem Wagen gefahren.
Klaus is with at least one friend with every car driven
'Klaus travelled with every car with at least one friend.'
Klaus ist mindestens einem Freund mit jedem Wagen gefahren.
∃ (comitative) ∀ (means)

∀ (means) ∃ (comitative)

Klaus ist mit mindestens einem Wagen mit jedem Freund gefahren.
∃ (means) ∀ (comitative)
∀ (comitative) ∃ (means)

Klaus ist mit jedem Wagen mindestens einem Freund gefahren.
∀ (comitative) ∃ (means)
∃ (comitative) ∀ (means)

Klaus ist mit jedem Freund mit mindestens einem Wagen gefahren.
∀ (comitative) ∃ (means)
∃ (comitative) ∀ (means)

Result (QS)

(2,2,0,0,0,0) Comitative > Means

A.1.14.7.2 Pair-List Reading

Mit welchem Freund ist Klaus mit jedem Wagen gefahren?

→ Mit welchem Wagen ist Klaus mit jedem Freund gefahren?

Result (PLR)

Comitative > Means

A.1.14.7.3 Informational Focus

Klaus ist mit Gisela mit dem Porsche gefahren.
Klaus is with Gisela with the Porsche driven
'Klaus went with the Porsche with Gisela.'

Mit wem ist Klaus mit dem Porsche gefahren?
Klaus ist mit Gisela mit dem Porsche gefahren.
Klaus ist mit dem Porsche mit Gisela gefahren.

Womit ist Klaus mit Gisela gefahren?
Klaus ist mit Gisela mit dem Porsche gefahren.
*K Klaus ist mit dem Porsche mit Gisela gefahren.

Result (IF)

(3,1) Comitative > Means
A.1.14.8 Means – Evidential

A.1.14.8.1 Quantifier Scope

Klaus ist gemäß mindestens eines Mitarbeiters mit jedem Wagen gefahren.
Klaus is according to at least one colleague with every car driven
'According to at least one colleague, Klaus travelled with every car.'

Klaus ist gemäß mindestens eines Mitarbeiters mit jedem Wagen gefahren.
∃ (witness) ∀ (means)
* ∀ (means) ∃ (witness)

Klaus ist mit mindestens einem Wagen gemäß jeden Mitarbeiters gefahren.
∀ (means) ∃ (witness)
∀ (witness) ∃ (means)

Klaus ist mit jedem Wagen gemäß mindestens eines Mitarbeiters gefahren.
∀ (means) ∃ (witness)
∃ (witness) ∀ (means)

Klaus ist gemäß jeden Mitarbeiters mit mindestens einem Wagen gefahren.
∀ (witness) ∀ (means)
* ∃ (means) ∀ (witness)

Result (QS)

(3,3,0,0,1,1) Evidential > Means

A.1.14.8.2 Pair-List Reading

Gemäß welchem Mitarbeiter ist Klaus mit jedem Wagen gefahren?

→ Mit welchem Wagen ist Klaus gemäß jedem Mitarbeiter gefahren?

Result (PLR)

Evidential > Means

A.1.14.8.3 Informational Focus

Michael ist gemäß Mika mit dem Mercedes gefahren.
Michael is according to Mika with the Mercedes driven
'According to Mika, Michael went with the Mercedes.'

Gemäß wem ist Michael mit dem Mercedes gefahren?

Michael ist gemäß Mika mit dem Mercedes gefahren.
Michael is with the Mercedes gemäß Mika driven.

Mit was ist Michael gemäß Mika gefahren?

Michael ist gemäß Mika mit dem Mercedes gefahren.
Michael is with the Mercedes gemäß Mika driven.
?? Michael is mit dem Mercedes gemäß Mika gefahren.
Result (IF)

(2,1) Evidential > Means

A.1.14.9 Means – Matter

At first sight, these two roles do not seem to be compatible. If Means and Instrumental really occupy different positions, Means is only compatible with pure motion verbs, which in turn seem not to allow a Matter adverbial.

A.1.14.10 Means – Goal

Since I tried to avoid to use motion verbs with the Goal adjunct to be sure, that the goal PP has no argumental status, I cannot add them to sentences with Means PPs. Remember, that the latter only go together with motion verbs.

A.1.14.11 Means – Source

A.1.14.11.1 Quantifier Scope

Klaus ist von mindestens einem Hafen mit jedem Boot gefahren.
Klaus is from at least one harbour with every boat driven.
'Klaus travelled with every boat from at least one harbour.'

Klaus ist von mindestens einem Hafen mit jedem Boot gefahren.
∃ (source) ∀ (means)
∀ (means) ∃ (source)

Klaus ist mit mindestens einem Boot von jedem Hafen gefahren.
∀ (source) ∃ (means)
∃ (means) ∀ (source)

Klaus ist mit jedem Boot von mindestens einem Hafen gefahren.
∀ (means) ∃ (source)
∃ (source) ∀ (means)

Klaus ist von jedem Hafen mit mindestens einem Boot gefahren.
∀ (source) ∃ (means)
∃ (means) ∀ (source)

Result (QS)

(1,1,0,0,0,0) Source > Means

A.1.14.11.2 Pair-List Reading

Von welchem Hafen ist Klaus mit jedem Boot gefahren?

→ Mit welchem Boot ist Klaus von jedem Hafen gefahren?
Result (PLR)

Source > Means

A.1.14.11.3 Informational Focus

Klaus ist von Venedig (aus) mit der Santa Lucia gesegelt.
Klaus is from Venice with the Santa Lucia sailed
'Klaus sailed with the Santa Lucia from Venice.'

Von welchem Hafen ist Klaus mit der "Santa Lucia" gesegelt?
Klaus ist von Venedig (aus) mit der Santa Lucia gesegelt.
Klaus is with the Santa Lucia from Venedig (aus) sailed.

Mit was ist Klaus von Venedig aus gesegelt?
Klaus ist von Venedig (aus) mit der Santa Lucia gesegelt.
?? Klaus is mit der Santa Lucia von Venedig (aus) gesegelt.

Result (IF)

(2,0) Source > Means

A.1.14.12 Means – Path

A.1.14.12.1 Quantifier Scope

Klaus ist über mindestens eine Strecke mit jedem Wagen gefahren.
Klaus is over at least one route with every car gone
'Klaus raced with every car on at least one route.'

Klaus ist über mindestens eine Strecke mit jedem Wagen gefahren.
∃ (path) ∀ (means)
∀ (means) ∃ (path)

Klaus ist mit mindestens einem Wagen über jede Strecke gefahren.
∃ (means) ∀ (path)
∀ (path) ∃ (means)

Klaus ist mit jedem Wagen über mindestens eine Strecke gefahren.
∀ (means) ∃ (path)
∃ (path) (means)

Klaus ist über jede Strecke mit mindestens einem Wagen gefahren.
∀ (path) ∃ (means)
∃ (means) ∀ (path)

Result (QS)

(1,0,0,1,0,0) Means ? Path
A.1.14.12.2 Pair-List Reading

→ Über welche Strecke ist Klaus mit jedem Wagen gefahren?

Mit welchem Wagen ist Klaus über jede Strecke gefahren?

Result (PLR)

Means > Path

A.1.14.12.3 Informational Focus

Klaus ist mit dem großen Laster über die holprige Landstraße gefahren.
Klaus is with the big truck over the uneven country road driven
'Klaus went on the uneven country road with the big truck.'

Über welche Strecke ist Klaus mit dem großen Laster gefahren?
Klaus ist mit dem großen Laster über die holprige Landstraße gefahren.
?? Klaus ist über die holprige Landstraße mit dem großen Laster gefahren.

Mit was ist Klaus über die holprige Landstraße gefahren?
Klaus ist mit dem großen Laster über die holprige Landstraße gefahren.
Klaus ist über die holprige Landstraße mit dem großen Laster gefahren.

Result (IF)

(2,0) Means > Path

A.1.14.13 Means – Malefactive

A.1.14.13.1 Quantifier Scope

Klaus ist gegen mindestens einen Rivalen mit jedem Wagen gefahren.
Klaus is against at least one competitor with every car driven
'Klaus raced with every car against at least one competitor.'

Klaus ist gegen mindestens einen Rivalen mit jedem Wagen gefahren.
∃ (opponent) ∀ (means)
?
∀ (means) ∃ (opponent)

Klaus ist mit mindestens einem Wagen gegen jeden Rivalen gefahren.
∃ (means) ∀ (opponent)
∀ (opponent) ∃ (means)

Klaus ist mit jedem Wagen gegen mindestens einen Rivalen gefahren.
∀ (means) ∃ (opponent)
∃ (opponent) ∀ (means)

Klaus ist gegen jeden Rivalen mit mindestens einem Wagen gefahren.
∀ (opponent) ∃ (means)
?? ∃ (means) ∀ (opponent)
Result (QS)

(1,2,0,0,0,0) Malefactive > Means

A.1.14.13.2 Pair-List Reading

Mit welchem Wagen ist Klaus gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Klaus mit jedem Wagen gefahren?

Result (PLR)

Means > Malefactive

A.1.14.13.3 Informational Focus

Michael ist mit dem blauen Ferrari gegen Rubens gefahren.
Michael is with the blue Ferrari against Rubens driven
'Michael raced with the blue Ferrari against Rubens.'

Gegen wen ist Michael mit dem blauen Ferrari gefahren?

Michael ist gegen Rubens mit dem blauen Ferrari gefahren.
Michael is mit dem blauen Ferrari gegen Rubens gefahren.

Mit was ist Michael gegen Rubens gefahren?

Michael ist gegen Rubens mit dem blauen Ferrari gefahren.

? Michael ist mit dem blauen Ferrari gegen Rubens gefahren.

Result (IF)

(1,1) Malefactive > Means

A.1.15 Duration Temporal1 (prepositional – "für")

A.1.15.1 Duration Temporal1 – Temporal

A.1.15.1.1 Pair-List Reading

Every year the Krüger family went in vacation for a certain amount of time.

→ Wie lange sind die Krügers in jedem Jahr in Ferien gefahren?

Result (PLR)

Temporal > Duration Temporal1

A.1.15.1.2 Informational Focus

Die Krügers sind im Jahre 2000 für drei Monate in Urlaub gefahren.
The Krügers are in+the year 2000 for three months in vacation driven
'The Krüger family went for a three months vacation in 2000.'
Wie lange sind die Krügers im Jahre 2000 in Urlaub gefahren?
Die Krügers sind im Jahre 2000 für drei Monate in Urlaub gefahren.
?? Die Krügers sind für drei Monate im Jahre 2000 in Urlaub gefahren.

In welchem Jahr sind die Krügers für drei Monate in Urlaub gefahren?
Die Krügers sind im Jahre 2000 für drei Monate in Urlaub gefahren.
Die Krügers sind für drei Monate im Jahre 2000 in Urlaub gefahren.

Result (IF)

(2,1) Temporal > Duration Temporal1

A.1.15.2 Duration Temporal1 – Benefactive

A.1.15.2.1 Pair-List Reading

Mr. Krüger got part of the vacation paid by several publishing houses, because he wrote articles for travel guides.

→ Wie lange ist Familie Krüger für jeden Verlag in Urlaub gefahren?

Result (PLR)

Benefactive > Duration Temporal1

A.1.15.2.2 Informational Focus

Familie Krüger ist für den Polyglott-Verlag für drei Monate in Urlaub gefahren.
Family Krüger is for the Polyglott publishing house for three months in vacation driven
'The Krüger family went for a three months vacation for the Polyglott publishing house.'

Wie lange ist Familie Krüger für den Polyglott-Verlag in Urlaub gefahren?
Familie Krüger ist für den Polyglott-Verlag für drei Monate in Urlaub gefahren.
Familie Krüger ist für drei Monate für den Polyglott-Verlag in Urlaub gefahren.

Für wen ist Familie Krüger für drei Monate in Urlaub gefahren?
Familie Krüger ist für den Polyglott-Verlag für drei Monate in Urlaub gefahren.
Familie Krüger ist für drei Monate für den Polyglott-Verlag in Urlaub gefahren.

Result (IF)

(0,1) Benefactive > Duration Temporal1
A.1.15.3 Duration Temporal1 – Reason

A.1.15.3.1 Pair-List Reading
The Krüger family went to Italy several times for reason of the good weather, the delicious vine, the historical monuments and the lovely landscape. In summertime, they went for three weeks because of the landscape, in springtime for two weeks because of the weather and in wintertime for 4 weeks because of the monuments. In 1994 they went there for 6 weeks because of all reasons.

→ Wie lange sind die Krügers wegen jedem Grund in Urlaub gefahren?

Result (PLR)

Reason > Duration Temporal1

A.1.15.3.2 Informational Focus

Familie Krüger ist wegen des guten Essens für drei Wochen nach Italien gefahren.

Family Krüger is because of the good meal for three weeks to Italy driven

'The Krüger family went to Italy for three weeks because of the good food.'

Wie lange ist Familie Krüger wegen des guten Essens nach Italien gefahren?
Familie Krüger ist wegen des guten Essens für drei Wochen nach Italien gefahren.

? Familie Krüger ist für drei Wochen wegen des guten Essens nach Italien gefahren.

Weswegen ist Familie Krüger für drei Wochen nach Italien gefahren?
Familie Krüger ist wegen des guten Essens für drei Wochen nach Italien gefahren.
Familie Krüger ist für drei Wochen wegen des guten Essens nach Italien gefahren.

Result (IF)

(1,0) Reason > Duration Temporal1

A.1.15.4 Duration Temporal1 – Locative

A.1.15.4.1 Pair-List Reading
Bernadette, the little daughter of the Krüger family, was going to school in every country the family was living.

→ Wie lange ist Bernadette in jedem Land zur Schule gegangen?

Result (PLR)

Locative > Duration Temporal1

A.1.15.4.2 Informational Focus

Bernadette ist in Holland für drei Jahre zur Schule gegangen.

Bernadette is in Holland for three years to school gone
Bernadette went to school for three years in Holland.
Wie lange ist Bernadette in Holland zur Schule gegangen?
Bernadette ist in Holland für drei Jahre zur Schule gegangen.

Wo ist Bernadette für drei Jahre zur Schule gegangen?
Bernadette ist in Holland für drei Jahre zur Schule gegangen.

Result (IF)

(1,1) Locative > Duration Temporal1

A.1.15.5 Duration Temporal1 – Instrumental

The "für" temporal construction seem to be very restrictive, only compatible with certain motion verbs. Therefore, there is no conflict with a Means of transport PP. Since certain instrumental PPs go together with motion verbs which express control of the moment by the driver like "steuern" (steering), "ein Auto fahren" (drive a car), "ein Flugzeug fliegen" (fly a plane), like e.g.

Er flog das Flugzeug mit dem neuen Steuerknüppel.
'He flew the plane with the new joy stick.'

we expect compatibility between Instrumental and Duration Temporal1. But:

* Er flog das Flugzeug für drei Tage mit dem neuen Steuerknüppel.
  'He flew the plane with the new joy stick for three days.'

* Er wollte das Flugzeug für drei Tage mit dem neuen Steuerknüppel fliegen.
  'He wanted/intended to fly the plane for three days with new joy stick.'

A.1.15.6 Duration Temporal1 – Manner

A.1.15.6.1 Pair-List Reading

Wie lange sind die Krügers auf jede Art in Urlaub gefahren?

Result (PLR)

Duration Temporal1 > Manner

A.1.15.6.2 Informational Focus

Familie Krüger ist für drei Monate auf abenteuerliche Weise in Urlaub gefahren.
Family Krüger is for three months in an adventurous way in vacation driven
'The Krüger family went for a three months vacation in an adventurous way.'

Wie lange ist Familie Krüger auf abenteuerliche Weise in Urlaub gefahren?
Familie Krüger ist für drei Monate auf abenteuerliche Weise in Urlaub gefahren.
Familie Krüger is for three months in an adventurous way in vacation driven
Wie ist Familie Krüger für drei Monate in Urlaub gefahren?
Familie Krüger ist auf abenteuerliche Weise für drei Monate in Urlaub gefahren.

Result (IF)

(1,1) Duration Temporal1 > Manner

A.1.15.7 Duration Temporal1 – Comitative

A.1.15.7.1 Informational Focus

Bernadette ist mit Christoph für drei Monate in Urlaub gefahren.
Bernadette is with Christoph for three months in vacation driven
'Bernadette went for a three months vacation with Christoph.'

Mit wem ist Bernadette für drei Monate in Urlaub gefahren?
Bernadette ist mit Christoph für drei Monate in Urlaub gefahren.
Bernadette ist für drei Monate mit Christoph in Urlaub gefahren.

Wie lange ist Bernadette mit Christoph in Urlaub gefahren?
Bernadette ist mit Christoph für drei Monate in Urlaub gefahren.

Result (IF)

(2,1) Comitative > Duration Temporal1

A.1.15.8 Duration Temporal1 – Evidential

A.1.15.8.1 Informational Focus

Familie Krüger ist gemäß Herrn Maier für drei Wochen in Urlaub gefahren.
Family Krüger is according to Mr. Maier for three weeks in vacation driven
'According to Mr. Maier, the Krüger family went for a three weeks vacation.'

Gemäß wem ist Familie Krüger für drei Wochen in Urlaub gefahren?
Familie Krüger ist gemäß Herrn Maier für drei Wochen in Urlaub gefahren.
Familie Krüger is für drei Wochen gemäß Herrn Maier in Urlaub gefahren.

Wie lange ist Familie Krüger gemäß Herrn Maier in Urlaub gefahren?
Familie Krüger ist gemäß Herrn Maier für drei Wochen in Urlaub gefahren.

Result (IF)

(2,1) Evidential > Duration Temporal1
A.1.15.9 Duration Temporal1 – Matter

A.1.15.9.1 Informational Focus

* Herr Krüger hat für drei Jahre über Istanbul geschrieben.
  Mr. Krüger has for three years about Istanbul written
  'Mr. Krüger wrote about Istanbul for three years.'

Wie lange hat Herr Krüger über Istanbul geschrieben?

* Herr Krüger hat für drei Jahre über Istanbul geschrieben.
  Herr Krüger hat drei Jahre lang über Istanbul geschrieben.

Result (IF)

The "für"- Temporal does not seem to be compatible with a matter adjunct, but the postpositional "lang"-Temporal is.

A.1.15.10 Duration Temporal1 – Goal

The "für"- Temporal does not seem to be compatible with a goal adjunct, but the postpositional "lang"-Temporal is:

  Bernadette has for three years to New York written
  'Bernadette wrote to New York for three years.'

Wie lange hat Bernadette nach New York geschrieben?


A.1.15.11 Duration Temporal1 – Source

A.1.15.11.1 Informational Focus

Mr. Krüger is from London in three hours to New York flown
'Mr. Krüger flew from London to New York in three hours.'

Von welchem Flughafen ist Herr Krüger in drei Stunden nach New York geflogen?


Wie lange ist Herr Krüger von London aus nach New York geflogen?


Familie Krüger ist von Frankfurt (aus) für drei Wochen in Urlaub gefahren.
Family Krüger is from Frankfurt for three weeks in vacation driven
'The Krüger family went for vacation for three weeks, starting from Frankfurt.'
Von wo ist Familie Krüger für drei Wochen in Urlaub gefahren?
Familie Krüger ist von Frankfurt (aus) für drei Wochen in Urlaub gefahren.
Familie Krüger ist für drei Wochen von Frankfurt (aus) in Urlaub gefahren.

Wie lange ist Familie Krüger von Frankfurt (aus) in Urlaub gefahren?
Familie Krüger ist von Frankfurt (aus) für drei Wochen in Urlaub gefahren.
Familie Krüger ist für drei Wochen von Frankfurt (aus) in Urlaub gefahren.

Result (IF)

(0,1) Source > Duration Temporal1

A.1.15.12 Duration Temporal1 – Path

A.1.15.12.1 Informational Focus

Krügers sind für drei Stunden über Mailand nach Paris geflogen.
Krügers are for three hours over Milan to Paris flown
'The Krüger family flew to Paris over Milan for three hours.'

Wie lange sind Krügers über Mailand nach Paris geflogen?
Krügers sind für drei Stunden über Mailand nach Paris geflogen.
Krügers sind über Mailand für drei Stunden nach Paris geflogen.
Krügers sind über Mailand nach Paris für drei Stunden geflogen.

Über welche Route sind Krügers für drei Stunden nach Paris geflogen?
Krügers sind für drei Stunden über Mailand nach Paris geflogen.
Krügers sind über Mailand nach Paris für drei Stunden geflogen.

without goal:

Wie lange sind Krügers über Mailand geflogen?
* Krügers sind für drei Stunden über Mailand geflogen.
("für"-PP needs the goal, because it is the stay in the goal that is determined)

Result (IF)

(1,0) Duration Temporal1 > Path

A.1.15.13 Duration Temporal1 – Malefactive

A.1.15.13.1 Informational Focus

Michael ist für vier Stunden gegen Mercedes gefahren.
Michael is for four hours against Mercedes driven
'Michael raced against Mercedes for four hours.'

Für wie lange ist Michael gegen Mercedes gefahren?
Er ist für vier Stunden gegen Mercedes gefahren.
Er ist gegen Mercedes für vier Stunden gefahren.
Gegen wen ist Michael für vier Stunden gefahren?
Er ist für vier Stunden gegen Mercedes gefahren.
? Er ist gegen Mercedes für vier Stunden gefahren.

Result (IF)

(1,1) Duration Temporal1 > Malefactive

A.1.15.14 Duration Temporal1 – Means of Transport

A.1.15.14.1 Pair-List Reading

→ Wie lange ist Familie Krüger mit jedem Auto in Urlaub gefahren?

Result (PLR)

Means > Duration Temporal1 ?

A.1.15.14.2 Informational Focus

Familie Krüger ist für drei Monate mit dem Wohnmobil in Urlaub gefahren.
Family Krüger is for three months with the camper in vacation driven
'The Krüger family went for a three months vacation with the Winnebago.'

Wie lange ist Familie Krüger mit dem Wohnmobil in Urlaub gefahren?
Familie Krüger ist für drei Monate mit dem Wohnmobil in Urlaub gefahren.
Familie Krüger is with the Winnebago for three months in vacation driven

Womit ist Familie Krüger drei Monate lang in Urlaub gefahren?
Familie Krüger ist für drei Monate mit dem Wohnmobil in Urlaub gefahren.
?? Familie Krüger ist mit dem Wohnmobil für drei Monate in Urlaub gefahren.

Result (IF)

(2,1) Duration Temporal1 > Means

A.1.16 Duration Temporal2 (prepositional – "in")

A.1.16.1 Duration Temporal2 – Temporal

The "in-" duration PP measures the amount of time that someone (or something) needs to achieve a certain goal. For this reason it is only compatible with perfective state of affairs. It is not possible to modify its DP with a universal operator (because the "in-" PP is a measure). Therefore, the Quantifier Scope test does not work and the Pair List test only in one direction, which gives no valuable result. The Informational focus test seems still to be working.

A.1.16.1.1 Informational Focus

Helmut was a sprinter. He hoped to be able to join the German olympic team. Therefore, he trained everyday very hard.
Helmut ist am Donnerstag die 1000 m in 7 min gelaufen.
Helmut is on Thursday the 1000 m in 7 min run
'Helmuth ran the 1000 m in 7 min on Thursday.'

In welcher Zeit ist Helmut am Donnerstag die 1000 m gelaufen?
Helmut ist am Donnerstag die 1000 m in 7 min gelaufen.
* Helmut is in 7 min am Donnerstag die 1000 m gelaufen.

Wann ist Helmut die 1000 m in 7 min gelaufen?
Helmut ist am Donnerstag die 1000 m in 7 min gelaufen.
Helmut ist die 1000 m in 7 min am Donnerstag gelaufen.

Result (IF)

(3,0) Temporal > Duration Temporal2

A.1.16.2 Duration Temporal2 – Benefactive

A.1.16.2.1 Informational Focus

After his great success at the Olympic games Helmut ran for several sponsors wearing fancy t-shirts with the names of some obscure shoe manufacturers.

 Helmut ist die 1000 m für Nike in 7 min gelaufen.
 Helmut is the 1000 m for Nike in 7 min run
 'Helmuth ran the 1000 m in 7 min for Nike.'

Für wen ist Helmut die 1000 m in 7m gelaufen?
Helmut ist die 1000 m in 7 min für Nike gelaufen.
Helmut ist die 1000 m für Nike in 7 min gelaufen.

In welcher Zeit ist Helmut die 1000 m für Nike gelaufen?
? Helmut ist die 1000 m in 7 min für Nike gelaufen.
Helmut ist die 1000 m für Nike in 7 min gelaufen.

Result (IF)

(1,0) Benefactive > Duration Temporal2

A.1.16.3 Duration Temporal2 – Reason

A.1.16.3.1 Informational Focus

 Helmut ist die 1000 m aus Ehrgeiz in 7 min gelaufen.
 Helmut is the 1000 m because of ambition in 7 min run
 'Helmuth ran the 1000 m in 7 min because of his ambition.'

Warum ist Helmut die 1000 m in 7 min gelaufen?
Helmut ist die 1000 m in 7 min aus Ehrgeiz gelaufen.
Helmut ist die 1000 m aus Ehrgeiz in 7 min gelaufen.
In welcher Zeit ist Helmuth die 1000 m aus Ehrgeiz gelaufen?

Helmuth ist die 1000 m *in 7 min* aus Ehrgeiz gelaufen.
Helmuth ist die 1000 m *in 7 min* aus Ehrgeiz gelaufen.

Result (IF)

(1,0) **Reason > Duration Temporal2**

A.1.16.4 **Duration Temporal2 – Locative**

A.1.16.4.1 **Informational Focus**

Helmuth ist die 1000 m in Rom in 7 min gelaufen.
Helmuth is the 1000 m in Rome in 7 min run
'Helmuth ran the 1000 m in 7 min in Rome.'

Wo ist Helmuth die 1000 m in 7 min gelaufen?

? Helmuth ist *in Rom* die 1000 m in 7 min gelaufen.
Helmuth ist die 1000 m in 7 min *in Rom* gelaufen.

In welcher Zeit ist Helmuth die 1000 m in Rom gelaufen?
Helmuth ist die 1000 m in Rom *in 7 min* gelaufen.
Helmuth ist *in 7 min* die 1000 m in Rom gelaufen.

Result (IF)

(1,0) **Locative > Duration Temporal2**

A.1.16.5 **Duration Temporal2 – Instrumental**

A.1.16.5.1 **Pair-List Reading**

In welcher Zeit hat Walter mit jedem Messer einen Kuchen geschnitten?

Result (PLR)

**Duration Temporal2 > Instrumental**

A.1.16.5.2 **Informational Focus**

Er hat den Apfel in 3 min mit dem neuen Mixer zerrieben.
He has the apple in 3 min with the new blender crushed
'He crushed the apple with the new blender in 3 min.'

Womit hat Walter den Apfel in 3 min zerrieben?

?? Er hat den Apfel *mit dem neuen Mixer* in 3 min zerrieben.
Er hat den Apfel in 3 min *mit dem neuen Mixer* zerrieben.

In welcher Zeit hat Walter mit dem neuen Mixer den Apfel zerrieben?
Er hat den Apfel mit dem neuen Mixer *in 3 min* zerrieben.
Er hat den Apfel *in 3 min* mit dem neuen Mixer zerrieben.
Result (IF)

(2,0)  Duration Temporal2 > Instrumental

A.1.16.6  Duration Temporal2 – Manner

A.1.16.6.1  Pair-List Reading

Wie lange sind die Krügers auf jede Art in Urlaub gefahren?

Result (PLR)

Duration Temporal2 > Manner

A.1.16.6.2  Informational Focus
Helmuth tried to run the 1000 m distance in different manner: very calm, sprinting, exhausted. The results were very different. The best way seemed to run in a very calm unexcited way.

Helmuth ist die 1000 m in 7 min auf ruhige Art gelaufen.
'Helmuth ran the 1000 m in 7 min in a quiet manner run

In welcher Zeit ist Helmuth die 1000 m auf ruhige Art gelaufen?
Helmuth ist die 1000 m auf ruhige Art in 7 min gelaufen.
Helmuth ist die 1000 m auf ruhige Art in 7 min gelaufen.

Wie ist Helmuth die 10 00 m in 7 min gelaufen?
?? Helmuth ist die 1000 m auf ruhige Art in 7 min gelaufen.

Result (IF)

(2,1)  Duration Temporal2 > Manner

A.1.16.7  Duration Temporal2 – Comitative

A.1.16.7.1  Informational Focus
Hans loved participating in cross country rallies. His favourite partners were Karl, Lisa and Benedict. Last Monday he went from Paris to Rome in only 3 hours.

Hans ist die Strecke mit Karl in 3 Stunden gefahren.
'Hans drove the distance in 3 hours (together) with Karl.'

Mit wem ist Hans die Strecke in 3 Stunden gefahren?
Hans ist die Strecke mit Karl in 3 Stunden gefahren.
Hans ist die Strecke in 3 Stunden mit Karl gefahren.

In welcher Zeit ist Hans die Strecke mit Karl gefahren?
Hans ist die Strecke mit Karl in 3 Stunden gefahren.
?? Hans ist die Strecke in 3 Stunden mit Karl gefahren.
Britta didn't believe the news that Helmuth had run that fast. But Klaus told her that there was a witness.

Helmuth is the 1000 m according to Willi in 7 min run.

'According to Willi, Helmuth ran the 1000 m in 7 min.'

Gemäß wem ist Helmuth die 1000 m gemäß Willi in 7 min gelaufen?

Helmuth is the 1000 m in 7 min gemäß Willi gelaufen.

Barbara wrote several letters to Michael about different topics.

Barbara has Michael in 10 min about her new admirer a letter written.

'Barbara wrote a letter about her new admirer in 10 min.'

In welcher Zeit hat sie Michael über ihren neuen Verehrer einen Brief geschrieben?

Barbara hat Michael über ihren neuen Verehrer in 10 min einen Brief geschrieben.
A.1.16.10 Duration Temporal2 – Goal

A.1.16.10.1 Informational Focus

Sie hat ihn (den Brief) in 10 min nach New York geschrieben.
She has it (the letter) in 10 min to New York written
'She wrote it to New York in 10 min.'

Wohin hat Barbara in 10 min einen Brief geschrieben?
Sie hat ihn (den Brief) in 10 min nach New York geschrieben.
Sie hat ihn (den Brief) nach New York in 10 min geschrieben.

In welcher Zeit hat Barbara einen Brief nach New York geschrieben?
?? Sie hat ihn (den Brief) in 10 min nach New York geschrieben.
Sie hat ihn (den Brief) nach New York in 10 min geschrieben.

One has to pay attention not to take "den Brief nach New York" as a single constituent, where direction directly modifies the noun. Therefore I put the brackets around the letter

Result (IF)

(2,0) Goal > Duration Temporal2 ??

A.1.16.11 Duration Temporal2 – Source

A.1.16.11.1 Informational Focus

Mr. Krüger is from London in 3 hours to New York flown
'Mr. Krüger flew from London to New York in 3 hours.'

Von welchem Flughafen ist Herr Krüger in drei Stunden nach New York geflogen?
Herr Krüger is in three hours from London to New York flown.
* Herr Krüger is in three hours from London von London geflogen.

Wie lange ist Herr Krüger von London aus nach New York geflogen?
Herr Krüger is from London in three hours to New York flown.

Result (IF)

(2,1) Source > Duration Temporal2
A.1.16.12 Duration Temporal2 – Path

A.1.16.12.1 Informational Focus

Krügers sind in drei Stunden über Mailand nach Paris geflogen.  
Krügers are in three hours over Milan to Paris flown  
'The Krüger family flew through Milan to Paris in three hours.'

Wie lange sind Krügers über Mailand nach Paris geflogen?  
?? Krügers sind in drei Stunden über Mailand nach Paris geflogen.  
?? Krügers sind über Mailand in drei Stunden nach Paris geflogen.  
Krügers sind in drei Stunden nach Paris über Mailand geflogen.  
Krügers sind nach Paris über Mailand in drei Stunden geflogen.

Über welche Route sind Krügers in drei Stunden nach Paris geflogen?  
?? Krügers sind in drei Stunden über Mailand nach Paris geflogen.  
Krügers sind in drei Stunden nach Paris über Mailand geflogen.

Result (IF)

(1,0) Duration Temporal2 - Path

A.1.16.13 Duration Temporal2 – Malefactive

A.1.16.13.1 Informational Focus

Helmuth ist die 1000 m in 7 min gegen Rüdiger gelaufen.  
Helmuth is the 1000 m in 7 min against Rüdiger run  
'Helmuth ran the 1000 m against Rüdiger in 7 min.'

Gegen wen ist Helmuth die 1000 m in 7 min gelaufen?  
Helmuth ist die 1000 m in 7 min gegen Rüdiger gelaufen.  
? Helmuth ist die 1000 m gegen Rüdiger in 7 min gelaufen.

In welcher Zeit ist Helmuth die 1000 m gegen Rüdiger gelaufen?  
Helmuth ist die 1000 m in 7 min gegen Rüdiger gelaufen.  
Helmuth ist die 1000 m gegen Rüdiger in 7 min gelaufen.

Result (IF)

(1,0) Duration Temporal2 > Malefactive
A.1.16.14 Duration Temporal2 – Means of Transport

A.1.16.14.1 Pair-List Reading

→ Wie lange ist Familie Krüger mit jedem Auto in Urlaub gefahren?

Result (PLR)

**Means > Duration Temporal2 ?**

A.1.16.14.2 Informational Focus

Jan ist diese Strecke in 3 Stunden mit dem Fahrrad gefahren.
Jan is this course in 3 hours with the bicycle run
'Jan ran this course with the bicycle in three hours.'

In welcher Zeit ist Jan diese Strecke mit dem Fahrrad gefahren?
Jan ist diese Strecke in 3 Stunden mit dem Fahrrad gefahren.
Jan ist diese Strecke in 3 Stunden mit dem Fahrrad gefahren.

Womit ist Jan diese Strecke in 3 Stunden gefahren?
Jan ist diese Strecke in 3 Stunden mit dem Fahrrad gefahren.

?? Jan ist diese Strecke mit dem Fahrrad in 3 Stunden gefahren.

Result (IF)

(2,0) **Duration Temporal2 > Means**

A.1.16.15 Duration Temporal2 – Duration Temporal1

A.1.16.15.1 Informational Focus

Helmuth went by airplane from Frankfurt to Tenerife. He intended to stay there for two weeks. The flight took him 3 hours.

Er ist in drei Stunden für zwei Wochen nach Teneriffa geflogen.
He is in three hours for two weeks to Tenerife flown
'He flew to Tenerife in three hours, in order to stay there two weeks.'

In welcher Zeit ist Helmuth für zwei Wochen nach Teneriffa geflogen?
**Er ist in drei Stunden für zwei Wochen nach Teneriffa geflogen.**
Er ist für zwei Wochen in drei Stunden nach Teneriffa geflogen.

Für wie lange ist Helmuth in drei Stunden nach Teneriffa geflogen?
Er ist in drei Stunden für zwei Wochen nach Teneriffa geflogen.
* Er ist für zwei Wochen in drei Stunden nach Teneriffa geflogen.

Result (IF)

(3,1) **Duration Temporal2 > Duration Temporal1**
A.1.17 Duration Temporal3 (postpositional – "lang")

A.1.17.1 Duration Temporal3 – Temporal

A.1.17.1.1 Pair-List Reading

In some cities of Germany the festival of carnival (Fastnacht, Fastelowwend, Karneval) is a major event of the year. The Krüger family loved carnival and went every year to another town to celebrate the festival. But the duration in every town was different.

→ Wie lange haben die Krügers in jedem Jahr Fastnacht gefeiert?

Result (PLR)

Temporal > Duration Temporal3

A.1.17.1.2 Informational Focus

Die Krügers haben im Jahre 2000 drei Wochen lang Fastnacht gefeiert.
The Krüger family celebrated carnival for three weeks in 2000.'

Wie lange haben die Krügers im Jahre 2000 Fastnacht gefeiert?
Die Krügers haben im Jahre 2000 drei Wochen lang Fastnacht gefeiert.
?? Die Krügers haben drei Wochen lang im Jahre 2000 Fastnacht gefeiert.

In welchem Jahr sind die Krügers für drei Monate / drei Monate lang in Urlaub gefahren?
Die Krügers haben im Jahre 2000 drei Wochen lang Fastnacht gefeiert.
Die Krügers haben drei Wochen lang im Jahre 2000 Fastnacht gefeiert.

Result (IF)

(2,1) Temporal > Duration Temporal3

A.1.17.2 Duration Temporal3 – Benefactive

A.1.17.2.1 Pair-List Reading

→ Wie lange ist Hans für jede Spedition gefahren?

Result (PLR)

Benefactive > Duration Temporal3

A.1.17.2.2 Informational Focus

Hans ist drei Jahre lang für die Nürnberger Spedition gefahren.
Hans is three years long for the removal firm of Nürnberg driven
'Hans drove for the removal firm of Nürnberg for three years.'
Wie lange ist Hans für die Nürnberger Spedition gefahren?
Hans ist für die Nürnberger Spedition drei Jahre lang gefahren.
Hans ist drei Jahre lang für die Nürnberger Spedition gefahren.

Für wen ist Hans drei Jahre lang gefahren?
?? Hans ist für die Nürnberger Spedition drei Jahre lang gefahren.
Hans ist drei Jahre lang für die Nürnberger Spedition gefahren.

Result (IF)

(2,0) Duration Temporal3 > Benefactive

A.1.17.3 Duration Temporal3 – Reason

A.1.17.3.1 Pair-List Reading

Wie lange haben die Mainzer aus jedem Grund gefeiert?

Result (PLR)

Reason > Duration Temporal3

A.1.17.3.2 Informational Focus

Die Mainzer haben drei Wochen lang wegen des Winterendes Fastnacht gefeiert
The Mainzians have three week long because of the end of winter carnival celebrated
'The people in Mainz celebrated carnival because of the end of winter for three weeks.'

Warum haben die Mainzer drei Wochen lang Fastnacht gefeiert?
Die Mainzer haben drei Wochen lang wegen des Winterendes Fastnacht gefeiert
? Die Mainzer haben wegen des Winterendes drei Wochen lang Fastnacht gefeiert

Wie lange haben die Mainzer wegen des Winterendes Fastnacht gefeiert?
Die Mainzer haben drei Wochen lang wegen des Winterendes Fastnacht gefeiert
Die Mainzer haben wegen des Winterendes drei Wochen lang Fastnacht gefeiert

Result (IF)

(1,1) Duration Temporal3 > Reason

A.1.17.4 Duration Temporal3 – Locative

A.1.17.4.1 Pair-List Reading

→ Wie lange hat man in jeder Stadt Fastnacht gefeiert?

Result (PLR)

Locative > Duration Temporal3
A.1.17.4.2  Informational Focus

Man hat in Mainz drei Wochen lang gefeiert.
One has in Mainz three weeks long celebrated
People celebrated for three weeks in Mainz.

In welcher Stadt hat man drei Wochen lang (Fastnacht) gefeiert?
Man hat in Mainz drei Wochen lang gefeiert.
Man hat drei Wochen lang in Mainz gefeiert.

Wie lange hat man in Mainz (Fastnacht) gefeiert?
Man hat in Mainz drei Wochen lang gefeiert.
* Man hat drei Wochen lang in Mainz gefeiert.

Result (IF)

(3,0)  Locative > Duration Temporal3

A.1.17.5  Duration Temporal3 – Instrumental

A.1.17.5.1  Pair-List Reading

→ Wie lange hat Boccioni die Skulptur mit jedem Instrument bearbeitet?

Result (PLR)

Instrumental > Duration Temporal3

A.1.17.5.2  Informational Focus

Boccioni hat die Sculptur drei Tage lang mit dem Meißel bearbeitet.
Boccioni has the sculpture three days long with the chisel worked
'Boccioni worked the sculpture with the chisel for three days.'

Wie lange hat Boccioni die Sculptur mit dem Meißel bearbeitet?
Boccioni hat die Sculptur drei Tage lang mit dem Meißel bearbeitet.
Boccioni hat die Sculptur mit dem Meißel drei Tage lang bearbeitet.

Mit was hat Boccioni die Sculptur drei Tage lange bearbeitet?
Boccioni hat die Sculptur drei Tage lang mit dem Meißel bearbeitet.
?? Boccioni hat die Sculptur mit dem Meißel drei Tage lang bearbeitet.

Result (IF)

(2,0)  Duration Temporal3 > Instrumental
A.1.17.6 Duration Temporal3 – Manner

A.1.17.6.1 Pair-List Reading

Wie lange haben die Mainzer auf jede Art gefeiert.

Result (PLR)

\[ \text{Duration Temporal3 > Manner} \]

A.1.17.6.2 Informational Focus

Die Mainzer haben drei Wochen lang auf ausgelassene Art gefeiert.
The Mainzians have three weeks long in a lively manner celebrated 'People in Mainz celebrated in a lively manner for three weeks.'

Wie lange haben die Mainzer auf ausgelassene Art gefeiert?

Die Mainzer haben \textit{drei Wochen lang auf ausgelassene Art gefeiert.}

Wie haben die Mainzer drei Wochen lang gefeiert?

Die Mainzer haben auf ausgelassene Art \textit{drei Wochen lang gefeiert.}

?? Die Mainzer haben \textit{auf ausgelassene Art} drei Wochen lang gefeiert.

Result (IF)

(2,1) \[ \text{Duration Temporal3 > Manner} \]

A.1.17.7 Duration Temporal3 – Comitative

A.1.17.7.1 Pair-List Reading

→ Wie lange hat Helmut mit jedem Freund gefeiert?

Result (PLR)

\[ \text{Comitative > Duration Temporal3} \]

A.1.17.7.2 Informational Focus

Helmut hat drei Wochen lang mit Barbara gefeiert.
Helmut has three weeks long with Barbara celebrated 'Helmut celebrated with Barbara three weeks long.'

Mit wem hat Helmut drei Wochen lang gefeiert?

Helmut hat drei Wochen lang \textit{mit Barbara} gefeiert.

? Helmut hat \textit{mit Barbara} drei Wochen lang gefeiert.

Wie lange hat Helmut mit Barbara gefeiert?

Helmut hat \textit{drei Wochen lang} mit Barbara gefeiert.

Helmut hat mit Barbara \textit{drei Wochen lang} gefeiert.

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Result (IF)

(1,0) Duration Temporal3 > Comitative

A.1.17.8 Duration Temporal3 – Evidential

A.1.17.8.1 Pair-List Reading

→ Wie lange haben die Mainzer gemäß jeder Zeitung gefeiert?

Result (PLR)

Evidential > Duration Temporal3

A.1.17.8.2 Informational Focus

Die Mainzer haben gemäß der Allgemeinen Zeitung drei Wochen lang gefeiert.
The Mainzians have according to the 'Allgemeine Zeitung' three weeks long celebrated
'According to the 'Allgemeine Zeitung', the people in Mainz celebrated for three weeks.'

Gemäß wem haben die Mainzer drei Wochen lang gefeiert?
Die Mainzer haben drei Wochen lang gemäß der Allgemeinen Zeitung gefeiert.
Die Mainzer haben gemäß der Allgemeinen Zeitung drei Wochen lang gefeiert.

Wie lange haben die Mainzer gemäß der Allgemeinen Zeitung gefeiert?
Die Mainzer haben gemäß der Allgemeinen Zeitung drei Wochen lang gefeiert.

Result (IF)

(1,0) Evidential > Duration Temporal3

A.1.17.9 Duration Temporal3 – Matter

A.1.17.9.1 Pair-List Reading

Wie lange hat Prof. Schmidt über jedes Thema geredet?

Result (PLR)

Duration Temporal3 > Matter

A.1.17.9.2 Informational Focus

Prof. Schmidt hat zwei Stunden lang über generative Syntax geredet.
Prof. Schmidt has two hours long about generative syntax talked
'Prof. Schmidt talked about generative syntax for two hours.'

Wie lange hat Prof. Schmidt über generative Syntax geredet?
Prof. Schmidt hat zwei Stunden lang über generative Syntax geredet.
Prof. Schmidt hat über generative Syntax zwei Stunden lang geredet.
Über was hat Prof. Schmidt zwei Stunden lang geredet?
 Prof. Schmidt hat zwei Stunden lang über generative Syntax geredet.
? Prof. Schmidt hat über generative Syntax zwei Stunden lang geredet.

Result (IF)

(1,1)  Duration Temporal3 > Matter

A.1.17.10 Duration Temporal3 – Goal

A.1.17.10.1 Pair-List Reading

Wie lange hat Barbar in jede Stadt geschrieben?

Result (PLR)

Duration Temporal3 > Goal

A.1.17.10.2 Informational Focus

Barbara hat zwei Jahre lang nach New York geschrieben.
Barbara has two years long to New York written
'Barbara wrote to New York for two years.'

Wohin hat Barbara zwei Jahre lang geschrieben?
Barbara hat zwei Jahre lang nach New York geschrieben.
?? Barbara hat nach New York zwei Jahre lang geschrieben.

Wie lange hat Barbara nach New York geschrieben?
Barbara hat zwei Jahre lang nach New York geschrieben.
Barbara hat nach New York zwei Jahre lang geschrieben.

Result (IF)

(2,0)  Duration Temporal3 > Goal2

A.1.17.11 Duration Temporal3 – Source

A.1.17.11.1 Pair-List Reading

Wie lange hat Michael aus jeder Stadt geschrieben?

Result (PLR)

Duration Temporal3 > Source

A.1.17.11.2 Informational Focus

Michael hat zwei Jahre lang aus London geschrieben.
Michael has two years long from London written
'Michael wrote from London for two years.'
Aus welcher Stadt hat Michael zwei Jahre lang geschrieben?
Michael hat zwei Jahre lang aus London geschrieben.
Michael hat aus London zwei Jahre lang geschrieben.

Wie lange hat Michael aus London geschrieben?
Michael hat zwei Jahre lang aus London geschrieben.
Michael hat aus London zwei Jahre lang geschrieben.

Result (IF)

(1,0) Duration Temporal3 > Source

A.1.17.12 Duration Temporal3 – Path

A.1.17.12.1 Pair-List Reading

Wie lange ist Hans über jede Strecke gefahren?

Result (PLR)

Duration Temporal3 > Path

A.1.17.12.2 Informational Focus

Hans ist drei Jahre lang über die Nationalstraße gefahren.
Hans is three years long over the national road driven
'Hans took the national road for three years.'

Über welche Strecke ist Hans drei Jahre lang gefahren?
Hans ist drei Jahre lang über die Nationalstraße gefahren.
Hans ist über die Nationalstraße drei Jahre lang gefahren.

Wie lange ist Hans über die Nationalstraße gefahren?
Hans ist drei Jahre lang über die Nationalstraße gefahren.
Hans ist über die Nationalstraße drei Jahre lang gefahren.

Result (IF)

(2,1) Duration Temporal3 > Path

A.1.17.13 Duration Temporal3 – Malefactive

A.1.17.13.1 Pair-List Reading

Wie lange ist Michael gegen jeden Rivalen gefahren.

Result (PLR)

Duration Temporal3 > Malefactive
A.1.17.13.2 Informational Focus

Michael ist zwei Jahre lang gegen Ralph gefahren.
'Michael raced against Ralph for two years.'

Gegen wen ist Michael zwei Jahre lang gefahren?
Michael ist gegen Ralph zwei Jahre lang gefahren.
Michael ist zwei Jahre lang gegen Ralph gefahren.

Wie lange ist Michael gegen Ralph gefahren?
Michael ist gegen Ralph zwei Jahre lang gefahren.
Michael ist zwei Jahre lang gegen Ralph gefahren.

Result (IF)

(1,1) Duration Temporal3 > Malefactive

A.1.17.14 Duration Temporal3 – Means

A.1.17.14.1 Informational Focus

Michael ist drei Stunden lang mit dem blauen Ferrari gefahren.
'Michael raced with the blue Ferrari for three hours.'

Mit welchem Wagen ist Michael drei Stunden lang gefahren?
Michael ist drei Stunden lang mit dem blauen Ferrari gefahren.

Wie lange ist Michael mit dem blauen Ferrari gefahren?
Michael ist mit dem blauen Ferrari drei Stunden lang gefahren.

Result (IF)

(2,1) Duration Temporal3 > Means

A.1.17.15 Duration Temporal3 – Duration Temporal1
If we combine these two thematic roles, the Duration Temporal3 becomes the measurement of the duration of an iterative process. Each single state of affairs of this process lasts the time indicated by the Duration Temporal1.

A.1.17.15.1 Informational Focus

Krügers sind 10 Jahre lang für drei Wochen nach Teneriffa gefahren.
Krügers are 10 years long for three weeks to Tenerife driven
'The Krüger family made a three weeks vacation in Tenerife for 10 years.'
Wie lange sind Krügers für drei Wochen nach Teneriffa gefahren?

Krügers sind **10 Jahre lang für drei Wochen nach Teneriffa gefahren.**
Krügers sind für drei Wochen **10 Jahre lang** nach Teneriffa gefahren.

Für wie lange sind Krügers 10 Jahre lang nach Teneriffa gefahren?

Krügers sind **10 Jahre lang für drei Wochen nach Teneriffa gefahren.**

\[\\text{?} \text{ Krügers sind } für drei Wochen 10 Jahre lang nach Teneriffa gefahren.\\]

Result (IF)

\[(1,1) \text{ Duration Temporal3 } > \text{ Duration Temporal1}\\]

A.1.17.16 Duration Temporal3 – Duration Temporal2

A.1.17.16.1 Informational Focus

Helmuth ist die 1000 m **5 Jahre lang** in 7 min gelaufen.
Helmuth is the 1000 m 5 years long in 7 min run
'Helmut ran the 1000 m in 7 min for 5 years.'

In welcher Zeit ist Helmuth 5 Jahre lang die 1000 meter gelaufen?
Er ist sie **5 Jahre lang in 7 min** gelaufen.

\[\\text{? Er ist sie in 7 min 5 Jahre lang gelaufen.}\\]

Wie lange ist Helmuth die 1000 meter in 7 min gelaufen?

Er ist sie **5 Jahre lang in 7 min** gelaufen.
Er ist sie in 7 min **5 Jahre lang** gelaufen.

Result (IF)

\[(1,1) \text{ Duration Temporal3 } > \text{ Duration Temporal2}\\]

A.1.18 Source Temporal1 (**"seit"** + time interval)

A.1.18.1 Source Temporal1 – Temporal

These two don't seem to be compatible with each other. This could indicate, that they occupy the same position.

A.1.18.2 Source Temporal1 – Benefactive

A.1.18.2.1 Informational Focus

Michael arbeitet seit drei Jahren für Ferrari.
Michael works since three years for Ferrari
'Michael is working for Ferrari since three years.'

Für wen arbeitet Michael seit drei Jahren?
Michael arbeitet seit drei Jahren **für Ferrari.**

\[\\text{?? Michael arbeitet für Ferraris seit drei Jahren}\\]
Wie lange arbeitet Michael schon für Ferrari?
Michael arbeitet seit drei Jahren für Ferrari.
Michael arbeitet für Ferrari seit drei Jahren.

Result (IF)

(2,0) Source Temporal1 > Benefactive

A.1.18.3 Source Temporal1 – Reason

A.1.18.3.1 Informational Focus

Michael arbeitet seit drei Jahren wegen seines Vertrages.
Michael works since three years because of his contract
'Michael is working because of his contract since three years.'

Warum arbeitet Michael seit drei Jahren?
Michael arbeitet seit drei Jahren wegen seines Vertrages.
?? Michael arbeitet wegen seines Vertrages seit drei Jahren.

Wie lange arbeitet Michael wegen seines Vertrages.
Michael arbeitet seit drei Jahren wegen seines Vertrages.
Michael arbeitet wegen seines Vertrages seit drei Jahren.

Result (IF)

(2,1) Source Temporal1 > Reason

A.1.18.4 Source Temporal1 – Locative

A.1.18.4.1 Informational Focus

Michael arbeitet seit drei Jahren in Italien.
Michael works since three years in Italy
'Michael is working in Italy since three years.'

Wo arbeitet Michael seit drei Jahren?
Michael arbeitet seit drei Jahren in Italien.
?? Michael arbeitet in Italien seit drei Jahren.

Wie lange arbeitet Michael (schon) in Italien?
Michael arbeitet seit drei Jahren in Italien.
Michael arbeitet in Italien seit drei Jahren.

Result (IF)

(1,0) Source Temporal1 > Locative
A.1.18.5 Source Temporal1 – Instrumental

A.1.18.5.1 Informational Focus

Michelangelo arbeitet seit zwei Jahren mit Gips.
Michelangelo works since two years with plaster
'Michelangelo is working with plaster since two years.'

Womit arbeitet Michelangelo seit zwei Jahren?
Michelangelo arbeitet seit zwei Jahren mit Gips.
* Michelangelo arbeitet mit Gips seit zwei Jahren.
Seit wann arbeitet Michelangelo mit Gips?
Michelangelo arbeitet seit zwei Jahren mit Gips.
Michelangelo arbeitet mit Gips seit zwei Jahren.

Result (IF)

(3,1) Source Temporal1 – Instrumental

A.1.18.6 Source Temporal1 – Manner

A.1.18.6.1 Informational Focus

Michael fährt seit drei Jahren auf rasante Art.
Michael drives since three years in a speedy way
'Michael is racing in a speedy way since three years.'

Wie fährt Michael seit drei Jahren?
Michael fährt seit drei Jahren auf rasante Art.
?? Michael fährt auf rasante Art seit drei Jahren.

Wie lange fährt Michael (schon) auf rasante Art?
Michael fährt seit drei Jahren auf rasante Art.
Michael fährt auf rasante Art seit drei Jahren.

Result (IF)

(2,1) Source Temporal1 > Manner

A.1.18.7 Source Temporal1 – Comitative

A.1.18.7.1 Informational Focus

Michael arbeitet seit drei Jahren mit Rubens.
Michael works since three years with Rubens
'Michael is working with Rubens since three years.'

Mit wem arbeitet Michael seit drei Jahren?
Michael arbeitet seit drei Jahren mit Rubens.
Wie lange arbeitet Michael (schon) mit Rubens.
Michael arbeitet seit drei Jahren mit Rubens.
Michael arbeitet mit Rubens seit drei Jahren.

Result (IF)

(1,0) Source Temporal1 > Comitative

A.1.18.8 Source Temporal1 – Evidential

A.1.18.8.1 Informational Focus

Michael arbeitet gemäß Ralph seit drei Jahren.
Michael works according to Ralph since three years
'According to Ralph, Michael is working since three years.'

Gemäß wem arbeitet Michael seit drei Jahren?
Michael arbeitet gemäß Ralph seit drei Jahren.
Michael arbeitet seit drei Jahren gemäß Ralph.

Wie lange arbeitet Michael gemäß Ralph?
Michael arbeitet gemäß Ralph seit drei Jahren.
?
Michael arbeitet seit drei Jahren gemäß Ralph.

Result (IF)

(1,0) Evidential > Source Temporal1

A.1.18.9 Source Temporal1 – Matter

A.1.18.9.1 Informational Focus

Prof. Schmidt schreibt seit vier Jahren über Keilschrift.
Prof. Schmidt writes since four years about cuneiform script
'Prof. Schmidt is writing about cuneiform script since four years.'

Wie lange schreibt Prof. Schmidt (schon) über Keilschrift?
Prof. Schmidt schreibt seit vier Jahren über Keilschrift.
Prof. Schmidt schreibt über Keilschrift seit vier Jahren.

Über was schreibt Prof. Schmidt seit vier Jahren?
Prof. Schmidt schreibt seit vier Jahren über Keilschrift.
?? Prof. Schmidt schreibt über Keilschrift seit vier Jahren.

Result (IF)

(2,1) Source Temporal1 > Matter
A.1.18.10 Source Temporal1 – Goal

A.1.18.10.1 Informational Focus

Barbara schreibt Michael seit drei Minuten nach New York.
Barbara writes Michael since three minutes to New York
'Barbara is writing since three minutes to Michael, who is in New York.'

Wohin schreibt Barbara Michael seit drei Minuten?
Barbara schreibt Michael seit drei Minuten nach New York.
* Barbara schreibt Michael nach New York seit drei Minuten.

Wie lange schreibt Barbara Michael schon nach New York?
Barbara schreibt Michael seit drei Jahren nach New York.
?? Barbara schreibt Michael nach New York seit drei Jahren.

Barbara schreibt Michael seit drei Jahren nach New York.
Barbara writes Michael since three years to New York
'Barbara is writing for three years to Michael, who is in New York.'

Wohin schreibt Barbara Michael seit drei Jahren?
Barbara schreibt Michael seit drei Jahren nach New York.

Wie lange schreibt Barbara Michael schon nach New York?
Barbara schreibt Michael seit drei Jahren nach New York.
Barbara schreibt Michael nach New York seit drei Jahren.

The second example is interpreted as an iteratively repeated process. Strangely with this interpretation the version where the goal PP under informational focus is in front of the temporal is less degraded. Maybe this is a pure semantic effect. I don't have any explanation for it. Another effect is that with the first interpretation the position of the goal in the Nachfeld is less grammatical:

* Barbara hat Michael seit drei Minuten geschrieben nach New York.


This seems to indicate, that in the first case the goal is interpreted as an argument. This would give an explanation for the very strong judgement even compared with manner and matter PPs.

Result (IF)

(3,1) Source Temporal1 > GPO
(2,0) Source Temporal1 (iterative) > Goal
A.1.18.11 Source Temporal1 – Source

A.1.18.11.1 Informational Focus

Michael schreibt seit drei Jahren aus Venedig.
Michael writes since three years from Venice
'Michael is writing from Venice since three years.'

Aus welcher Stadt schreibt Michael seit drei Jahren?
Michael schreibt seit drei Jahren aus Venedig.
?? Michael schreibt aus Venedig seit drei Jahren.

Wie lange schreibt Michael (schon) aus Venedig?
Michael schreibt seit drei Jahren aus Venedig.
Michael schreibt aus Venedig seit drei Jahren.

Result (IF)

(2,1) Source Temporal1 > Source

A.1.18.12 Source Temporal1 – Path

A.1.18.12.1 Informational Focus

Michael fährt seit drei Jahren über die Autobahn.
Michael drives since three years on the freeway
'Michael drives on the freeway since three years.'

Wie lange fährt Michael (schon) über die Autobahn (nach Mainz)?
Michael fährt seit drei Jahren über die Autobahn.
Michael fährt über die Autobahn seit drei Jahren.

Worüber / Über welche Strecke fährt Michael seit drei Jahren?
Michael fährt seit drei Jahren über die Autobahn.
* Michael fährt über die Autobahn seit drei Jahren.

Result (IF)

(3,1) Source Temporal1 > Path

A.1.18.13 Source Temporal1 – Malefactive

A.1.18.13.1 Informational Focus

Michael fährt seit 10 Jahren gegen Ralph.
Michael drives since 10 years against Ralph
'Michael is racing against Ralph since 10 years.'

Wie lange fährt Michael (schon) gegen Ralph?
Michael fährt seit 10 Jahren gegen Ralph.
Michael fährt gegen Ralph seit 10 Jahren.
Gegen wen fährt Michael schon seit 10 Jahren?
Michael fährt seit 10 Jahren gegen Ralph.
? Michael fährt gegen Ralph seit 10 Jahren.

Result (IF)

(1,1) Source Temporal1 > Malefactive

A.1.18.14 Source Temporal1 – Means

A.1.18.14.1 Informational Focus

Michael fährt seit drei Jahren mit dem roten Ferrari.
'Michael drives since three years with the red Ferrari'

Mit was fährt Michael seit drei Jahren?
Michael fährt seit drei Jahren mit dem roten Ferrari.
?? Michael fährt mit dem roten Ferrari seit drei Jahren.

Wie lange fährt Michael schon mit dem roten Ferrari?
Michael fährt seit drei Jahren mit dem roten Ferrari.
Michael fährt mit dem roten Ferrari seit drei Jahren.

Result (IF)

(2,1) Source Temporal1 > Means

A.1.18.15 Source Temporal1 – Duration Temporal1

A.1.18.15.1 Informational Focus

Sie fahren seit drei Jahren für zwei Wochen in Urlaub.
'They drive since three years for two weeks in vacation'

Für wie lange fahren Krügers seit drei Jahren in Urlaub?
Sie fahren seit drei Jahren für zwei Wochen in Urlaub.
?? Sie fahren für zwei Wochen seit drei Jahren in Urlaub.

Seit wann fahren Krügers (jedes Jahr) für zwei Wochen in Urlaub?
Sie fahren seit drei Jahren für zwei Wochen in Urlaub.
Sie fahren für zwei Wochen seit drei Jahren in Urlaub.

Result (IF)

(2,1) Source Temporal1 > Duration Temporal1
A.1.18.16 Source Temporal1 – Duration Temporal2

A.1.18.16.1 Informational Focus

Helmuth rennt die 1000 m seit 3 Jahren in 7 min.
Helmuth runs the 1000 m since 3 years in 7 min
'Since 3 years, Helmuth runs the 1000 m in 7 min.'

In welcher Zeit rennt Helmuth die 1000 m seit 3 Jahren?
Er rennt sie seit 3 Jahren in 7 min.
* Er rennt sie in 7 min seit 3 Jahren.

Seit wann rennt Helmuth die 1000 m in 7 min?
Er rennt sie seit 3 Jahren in 7 min.
Er rennt sie in 7 min seit 3 Jahren.

Result (IF)

(3,1) Source Temporal1 > Duration Temporal2

A.1.18.17 Source Temporal1 – Duration Temporal3

Strangely, these two roles seem to be incompatible, though semantically they should be compatible. We would expect a sentence like

* Die Krügers fuhren seit drei Jahren vier Wochen lang nach Helgoland
   The Krüger family went since three years for four weeks to Helgoland

with the meaning of: In the last three years, the Krüger family went every year to the island of Helgoland and actually stayed there (as opposed to the intentional "für vier Wochen) four weeks, to be grammatical. But yet it is not!

A.1.19 Source Temporal2 ("seit" + time point)

A.1.19.1 Source Temporal2 – Temporal

Since the Since Temporal2 PP consists of preposition and a time point DP, the fact that it is hard to combine with an ordinary temporal doesn't come as a surprise. Maybe, we can provide a background to make it work:

A.1.19.1.1 Informational Focus

John didn't really like to work and tried to avoid it whenever he could. In the last ten years he only worked in the summer months, normally from May until August. But last year he really ran out of money and started earlier with work.
Since the "seit"- PP doesn't go well with state of affairs of the past, I chose the "ab"-PP for the second question. Because the answer is in the present tense, I can use the "seit"-PP.

Er arbeitet in diesem Jahr seit April.
He works in this year since april
'He is working since april this year.'
Seit wann arbeitet Hans in diesem Jahr?
Er arbeitet in diesem Jahr seit April.
?? Er arbeitet seit April in diesem Jahr.

In welchem Jahr hat Hans ab April gearbeitet?
Er arbeitet in diesem Jahr seit April.
?? Er arbeitet seit April in diesem Jahr.

Result (IF)

(2,1) Temporal > Source Temporal2

A.1.19.2 Source Temporal2 – Benefactive

A.1.19.2.1 Informational Focus

Michael arbeitet seit Montag für Ferrari.
Michael works since Monday for Ferrari
'Since Monday, Michael is working for Ferrari.'

Für wen arbeitet Michael seit Montag?
Michael arbeitet seit Montag für Ferrari.
? Michael arbeitet für Ferrari seit Montag.

Wie lange arbeitet Michael schon für Ferrary?
Michael arbeitet seit Montag für Ferrari.
Michael arbeitet für Ferrari seit Montag.

Result (IF)

(1,0) Source Temporal2 > Benefactive

A.1.19.3 Source Temporal2 – Reason

A.1.19.3.1 Informational Focus

Michael arbeitet seit November wegen eines großen Auftrages.
Michael works since November because of a big order
'Michael is working because of a big order since November.'

Warum arbeitet Michael seit November?
Michael arbeitet seit November wegen eines großen Auftrages.
? Michael arbeitet wegen eines großen Auftrages seit November.

Wie lange arbeitet Michael wegen des großen Auftrages.
Michael arbeitet seit November wegen des großen Auftrages.
Michael arbeitet wegen des großen Auftrages seit November.

Result (IF)

(1,0) Source Temporal2 > Reason
A.1.19.4 Source Temporal2 – Locative

A.1.19.4.1 Informational Focus

Michael arbeitet in Italien seit November.
Michael works in Italy since November
'Michael is working since November in Italy.'

Wo arbeitet Michael seit November?
Michael arbeitet seit November in Italien.
Michael arbeitet in Italien seit November.

Wie lange arbeitet Michael (schon) in Italien?
? Michael arbeitet seit November in Italien.
Michael arbeitet in Italien seit November.

Result (IF)

(1,0) Locative > Source Temporal2

A.1.19.5 Source Temporal2 – Instrumental

A.1.19.5.1 Informational Focus

Karin repariert das Radio seit 3 Uhr mit einem Schraubenzieher.
Karin repairs the radio since 3 o'clock with a screwdriver
'Karin is repairing the radio with a screwdriver since 3 o'clock.'

Wie lange repariert Karin (schon) das Radio mit einem Schraubenzieher?
Sie repariert das Radio seit 3 Uhr mit einem Schraubenzieher.
? Sie repariert das Radio seit 3 Uhr mit einem Schraubenzieher.

Mit was repariert Karin das Radio seit zwei Stunden?
Sie repariert das Radio seit 3 Uhr mit einem Schraubenzieher.
?? Sie repariert das Radio mit einem Schraubenzieher seit 3 Uhr.

Result (IF)

(2,1) Source Temporal2 > Instrumental

A.1.19.6 Source Temporal2 – Manner

A.1.19.6.1 Informational Focus

Michael fährt seit November auf rasante Art.
Michael drives since November in a speedy way
'Since November, Michael is racing in a speedy way.'
Wie fährt Michael seit November?
Michael fährt seit November auf rasante Art.
? Michael fährt auf rasante Art seit November.

Wie lange fährt Michael (schon) auf rasante Art?
Michael fährt seit November auf rasante Art.
Michael fährt auf rasante Art seit November.

Result (IF)
(1,1) Source Temporal2 > Manner

A.1.19.7 Source Temporal2 – Comitative

A.1.19.7.1 Informational Focus

Michael arbeitet seit November mit Rubens.
Michael works since November with Rubens
'Michael is working with Rubens since November.'

Mit wem arbeitet Michael seit November?
Michael arbeitet seit November mit Rubens.
? Michael arbeitet mit Rubens seit November.

Wie lange arbeitet Michael (schon) mit Rubens.
Michael arbeitet seit November mit Rubens.
Michael arbeitet mit Rubens seit November.

Result (IF)
(1,0) Source Temporal2 > Comitative

A.1.19.8 Source Temporal2 – Evidential

A.1.19.8.1 Informational Focus

Michael arbeitet gemäß Ralph seit November.
Michael works according to Ralph since November
'According to Ralph, Michael is working since November.'

Gemäß wem arbeitet Michael seit November?
Michael arbeitet gemäß Ralph seit November.
Michael arbeitet seit November gemäß Ralph.

Wie lange arbeitet Michael gemäß Ralph?
Michael arbeitet gemäß Ralph seit November.
? Michael arbeitet seit November gemäß Ralph.

Result (IF)
(1,1) Evidential > Source Temporal2
A.1.19.9 Source Temporal2 – Matter

A.1.19.9.1 Informational Focus

Prof. Schmidt schreibt seit November über Keilschrift.
Prof. Schmidt writes since November about cuneiform script
'Prof. Schmidt is writing about cuneiform script since November.'

Wie lange schreibt Prof. Schmidt (schon) über Keilschrift?
Prof. Schmidt schreibt seit November über Keilschrift.
Prof. Schmidt schreibt über Keilschrift seit November.

Über was schreibt Prof. Schmidt seit November?
Prof. Schmidt schreibt seit November über Keilschrift.
?? Prof. Schmidt schreibt über Keilschrift seit November.

Result (IF)

(2,0) Source Temporal2 > Matter

A.1.19.10 Source Temporal2 – Goal

A.1.19.10.1 Informational Focus

Barbara schreibt Michael seit 8 Uhr nach New York.
Barbara writes to Michael since 8 o'clock to New York
'Since 8 o'clock, Barbara is writing to Michael who is in New York.'

Wohin schreibt Barbara Michael seit 8 Uhr?
Barbara schreibt Michael seit 8 Uhr nach New York.
* Barbara schreibt Michael nach New York seit 8 Uhr.

Wie lange schreibt Barbara Michael schon nach New York?
Barbara schreibt Michael seit 8 Uhr nach New York.
Barbara schreibt Michael nach New York seit 8 Uhr.

Wohin schreibt Barbara Michael seit November?
Barbara schreibt Michael seit November nach New York.
?? Barbara schreibt Michael nach New York seit November.

Wie lange schreibt Barbara Michael schon nach New York?
Barbara schreibt Michael seit November nach New York.
Barbara schreibt Michael nach New York seit November.

The second example is interpreted as an iteratively repeated process. With this interpretation, the version where the goal PP under informational focus is in front of the temporal is less degraded. Maybe this is a pure semantic effect. I don't have any explanation for it. With the first interpretation, the position of the goal in the Nachfeld is less grammatical:

* Barbara hat Michael seit 8 Uhr geschrieben nach New York.
Barbara hat Michael seit November geschrieben nach New York.

This seems to indicate, that in the first case the goal is interpreted as an argument. This would give an explanation for the very strong judgement even compared with manner and matter PPs.

Result (IF)

(3,1) Source Temporal2 > GPO
(2,0) Source Temporal2 (iterative) > Goal

A.1.19.11 Source Temporal2 – Source

A.1.19.11.1 Informational Focus

Michael schreibt seit November aus Venedig.
Michael writes since November from Venice
'Since November, Michael is writing (letters) from Venice.'

Aus welcher Stadt schreibt Michael seit November?
Michael schreibt seit November aus Venedig.
Michael schreibt aus Venedig seit November.

Wie lange schreibt Michael (schon) aus Venedig?
Michael schreibt seit November aus Venedig.
Michael schreibt aus Venedig seit November.

Result (IF)

(1,0) Source Temporal2 > Source

A.1.19.12 Source Temporal2 – Path

A.1.19.12.1 Informational Focus

Michael fährt seit November über die Autobahn.
Michael drives since November on the freeway
'Since November, Michael drives on the freeway.'

Wie lange fährt Michael (schon) über die Autobahn (nach Mainz)?
Michael fährt seit November über die Autobahn.
Michael fährt über die Autobahn seit November.

Worüber / Über welche Strecke fährt Michael seit November?
Michael fährt seit November über die Autobahn.
Michael fährt über die Autobahn seit November.

Result (IF)

(3,1) Source Temporal2 > Path
A.1.19.13 Source Temporal2 – Malefactive

A.1.19.13.1 Informational Focus

Michael fährt seit November gegen Ralph. 
Michael drives since November against Ralph 
'Michael is racing against Ralph since November.'

Wie lange fährt Michael (schon) gegen Ralph? 
**Michael fährt seit November gegen Ralph.** 
Michael fährt gegen Ralph seit November

Gegen wen fährt Michael schon seit November? 
Michael fährt seit November gegen Ralph. 
? Michael fährt gegen Ralph seit November.

Result (IF)

(1,1) Source Temporal2 > Malefactive

A.1.19.14 Source Temporal2 – Means

A.1.19.14.1 Informational Focus

Michael fährt seit November mit dem roten Ferrari. 
Michael drives since November with the red Ferrari 
'Michael is racing with the red Ferrari since November.'

Mit was fährt Michael seit November? 
Michael fährt seit November mit dem roten Ferrari. 
? Michael fährt mit dem roten Ferrari seit November.

Wie lange fährt Michael schon mit dem roten Ferrari? 
**Michael fährt seit November mit dem roten Ferrari.** 
Michael fährt mit dem roten Ferrari seit November.

Result (IF)

(1,1) Source Temporal2 > Means

A.1.19.15 Source Temporal2 – Duration Temporal1

The two thematic roles seem to be incompatible. Even a sentence like:

* Die Krügers fahren seit 1989 für drei Wochen in Urlaub. 
The Krügers go since 1989 for three weeks in vacation. 
The Krüger family goes for vacation for three weeks (ever) since 1989.

is totally ungrammatical and has not even a repetitive reading as in the case of the Source Temporal1:
Die Kügers fahren seit 5 Jahren für drei Wochen in Urlaub.
The Krüger(pl.) go since 5 years for three weeks in vacation.
Since 5 years the Krüger family goes for a three weeks vacation.

with the interpretation: every year of the last 5 years the Krüger family goes into vacation and the vacations always last for three weeks. The contrast seems surprising and semantically there is no reason why not to interpret the above sentence as:

Ever since 1989 the Krüger family goes every year into vacation which always last for three weeks.

A.1.19.16 Source Temporal2 – Duration Temporal2

A.1.19.16.1 Informational Focus

Helmuth läuft die 1000 m seit 1995 in 7 min.
Helmuth runs the 1000 m since 1995 in 7 min
'Helmuth runs the 1000 m in 7 min since 1995.'

Wie lange läuft Helmuth schon die 1000 m in 7 min?
Helmuth läuft die 1000 m seit 1995 in 7 min.
Helmuth läuft die 1000 m in 7 min seit 1995.

In welcher Zeit läuft Helmuth die 1000 m seit 1995?
Helmuth läuft die 1000 m seit 1995 in 7 min.
?? Helmuth läuft die 1000 m in 7 min seit 1995.

Result (IF)

(2,0) Source Temporal2 > Duration Temporal2

A.1.19.17 Source Temporal2 – Duration Temporal3

A.1.19.17.1 Informational Focus

Die Mainzer feiern seit 1945 zwei Wochen lang Fassenacht.
The Mainzians celebrated since 1945 two weeks long carnival
'Since 1945 the people in Mainz celebrated carnival for two weeks.'

Seit wann feiern die Mainzer zwei Wochen lang Fassenacht?
Die Mainzer feiern seit 1945 zwei Wochen lang Fassenacht.
?? Die Mainzer feiern seit 1945 zwei Wochen lang seit 1945 Fassenacht.

Wie lange feiern die Mainzer seit 1945 Fassenacht?
Die Mainzer feiern seit 1945 zwei Wochen lang Fassenacht.
* Die Mainzer feiern zwei Wochen lang seit 1945 Fassenacht.

Result (IF)

(3,1) Source Temporal2 > Duration Temporal3
A.1.19 Source Temporal2 – Source Temporal1
These are definitely incompatible. At least semantically, it would make no sense to adjoin two Source Temporals with conflicting information. And a announcement like

Er schrieb seit 3 Jahren seit 1997 an seinem Roman.
He wrote since 3 years since 1997 at his novel.
He was writing his novel since 3 years, since 1997.
done in the year 2000 could only be interpreted as an apposition.

A.1.20 Source Temporal3 ("ab" + time point)

A.1.20.1 Source Temporal3 – Temporal

A.1.20.1.1 Informational Focus
Bernd is working 6 days a week, but he begins every at a different time.

Bernd hat am Donnerstag ab 8 Uhr gearbeitet.
Bernd has on Thursday from 8 o'clock on worked
'On Thursday, Bernd worked from 8 o'clock on.'

Wann hat Bernd ab 8 Uhr gearbeitet?
Bernd hat am Donnerstag ab 8 Uhr gearbeitet.
Bernd hat ab 8 Uhr am Donnerstag gearbeitet.

Ab wann hat Bernd am Donnerstag gearbeitet?
Bernd hat am Donnerstag ab 8 Uhr gearbeitet.
?? Bernd hat ab 8 Uhr am Donnerstag gearbeitet.

Result (IF)

(2,1) Temporal > Source Temporal3

A.1.20.2 Source Temporal3 – Benefactive

A.1.20.2.1 Informational Focus

Michael hat (gestern) ab 10 Uhr für Ferrari gearbeitet.
Michael has (yesterday) from 10 o'clock on for Ferrari worked
'(Yesterday,) Michael worked for Ferrari from 10 o'clock on.'

Für wen hat Michael gestern ab 10 Uhr gearbeitet?
Michael hat (gestern) ab 10 Uhr für Ferrari gearbeitet.
Michael hat (gestern) für Ferrari ab 10 Uhr gearbeitet.

Ab wann hat Michael gestern für Ferrari gearbeitet?
Michael hat (gestern) ab 10 Uhr für Ferrari gearbeitet.
Michael hat (gestern) für Ferrari ab 10 Uhr gearbeitet.
Result (IF)

(1,0) **Source Temporal3 > Benefactive**

**A.1.20.3 Source Temporal3 – Reason**

**A.1.20.3.1 Informational Focus**

Michael hat ab 6 Uhr wegen des Staatsauftrages gearbeitet.  
'Michael worked because of the appointment of the government from 6 o'clock on.'

Warum hat Michael gestern (schon) ab 6 Uhr gearbeitet?  
Michael hat (gestern) ab 6 Uhr wegen des Staatsauftrages gearbeitet.  
'Michael worked because of the appointment of the government from 6 o'clock on.'

Ab wann hat Michael gestern wegen des Staatsauftrages gearbeitet?  
Michael hat (gestern) ab 6 Uhr wegen des Staatsauftrages gearbeitet.  
'Michael worked because of the appointment of the government from 6 o'clock on.'

Result (IF)

(1,0) **Source Temporal3 > Reason**

**A.1.20.4 Source Temporal3 – Locative**

**A.1.20.4.1 Informational Focus**

Michael hat (gestern) ab 12 Uhr in der Küche gearbeitet.  
'(Yesterday,) Michael worked in the kitchen from 12 o'clock on.'

Wo hat Michael gestern ab 12 Uhr gearbeitet?  
Michael hat (gestern) ab 12 Uhr in der Küche gearbeitet.  
'(Yesterday,) Michael worked in the kitchen from 12 o'clock on.'

Ab wann hat Michael gestern in der Küche gearbeitet?  
Michael hat (gestern) ab 12 Uhr in der Küche gearbeitet.  
'Michael worked in the kitchen from 12 o'clock on.'

Result (IF)

(1,0) **Source Temporal3 > Locative**

**A.1.20.5 Source Temporal3 – Instrumental**

**A.1.20.5.1 Informational Focus**

Franz hat ab 8 Uhr mit einer Schere Kartoffeln geschält.  
'Franz peeled potatoes with scissors from 8 o'clock on.'
Mit was hat Franz ab 8 Uhr Kartoffeln geschält?
Franz hat ab 8 Uhr mit einer Schere Kartoffeln geschält.
? Franz hat mit einer Schere ab 8 Uhr Kartoffeln geschält.

Ab wann hat Franz mit einem Schere Kartoffeln geschält?
Franz hat ab 8 Uhr mit einer Schere Kartoffeln geschält.
Franz hat mit einer Schere ab 8 Uhr Kartoffeln geschält.

Result (IF)

(1,0) Source Temporal3 > Instrumental

A.1.20.6 Source Temporal3 – Manner

A.1.20.6.1 Informational Focus

Michael ist (gestern) ab 10 Uhr auf rasante Art gefahren.
Michael is (yesterday) from 10 o'clock on in a speedy way driven
'(Yesterday,) Michael raced in a speedy way from 10 o'clock on.'

Wie ist Michael gestern ab 10 Uhr gefahren?
Michael ist (gestern) ab 10 Uhr auf rasante Art gefahren.
* Michael ist (gestern) auf rasante Art ab 10 Uhr gefahren.

Ab wann ist Michael gestern auf rasante Art gefahren?
Michael ist (gestern) ab 10 Uhr auf rasante Art gefahren.
Michael ist (gestern) auf rasante Art ab 10 Uhr gefahren.

Result (IF)

(3,1) Source Temporal3 > Manner

A.1.20.7 Source Temporal3 – Comitative

A.1.20.7.1 Informational Focus

Michael hat (gestern) ab 10 Uhr mit Paul gearbeitet.
Michael has (yesterday) from 10 o'clock on with Paul worked
'(Yesterday,) Michael worked with Paul from 10 o'clock on.'

Mit wem hat Michael gestern ab 10 Uhr gearbeitet?
Michael hat (gestern) ab 10 Uhr mit Paul gearbeitet.
? Michael hat (gestern) mit Paul ab 10 Uhr gearbeitet.

Ab wann hat Michael (gestern) mit Paul gearbeitet.
Michael hat (gestern) ab 10 Uhr mit Paul gearbeitet.
Michael hat (gestern) mit Paul ab 10 Uhr gearbeitet.
Result (IF)

(1,0)  Source Temporal3 > Comitative

A.1.20.8  Source Temporal3 – Evidential

A.1.20.8.1  Informational Focus

Michael hat gemäß Ralph ab 10 Uhr gearbeitet.
Michael has according to Ralph from 10 o'clock on worked
'According to Ralph, Michael worked from 10 o'clock.'

Gemäß wem hat Michael gestern ab 10 Uhr gearbeitet?
Michael hat gemäß Ralph ab 10 Uhr gearbeitet.
Michael hat ab 10 Uhr gemäß Ralph gearbeitet.

Ab wann hat Michael gestern gemäß Ralph gearbeitet?
Michael hat gemäß Ralph ab 10 Uhr gearbeitet.
?? Michael hat ab 10 Uhr gemäß Ralph gearbeitet.

Result (IF)

(2,0)  Evidential > Source Temporal3

A.1.20.9  Source Temporal3 – Matter

A.1.20.9.1  Informational Focus

Prof. Schmidt hat (gestern) ab 10 Uhr über Keilschrift gesprochen.
Prof. Schmidt has (yesterday) from 10 o'clock on about cuneiform script talked
'(Yesterday,) Prof. Schmidt talked about cuneiform script from 10 o'clock on.'

Ab wann hat Prof. Schmidt gestern über Keilschrift gesprochen?
Prof. Schmidt hat (gestern) ab 10 Uhr über Keilschrift gesprochen.
Prof. Schmidt hat (gestern) über Keilschrift ab 10 Uhr gesprochen.

Über was hat Prof. Schmidt gestern ab 10 Uhr gesprochen?
Prof. Schmidt hat (gestern) ab 10 Uhr über Keilschrift gesprochen.
* Prof. Schmidt hat (gestern) über Keilschrift ab 10 Uhr gesprochen.

Result (IF)

(3,1)  Source Temporal3 > Matter

A.1.20.10  Source Temporal3 – Goal

A.1.20.10.1  Informational Focus

Barbara hat gestern ab 10 Uhr nach New York telefoniert.
Barbara has yesterday from 10 o'clock on to New York called
'Yesterday, Barbara made a phone call to New York from 10 o'clock on.'
Ab wann hat Barbara gestern nach New York telefoniert?
Barbara hat gestern \textit{ab 10 Uhr} nach New York telefoniert.
Barbara hat gestern nach New York \textit{ab 10 Uhr} telefoniert.

Wohin hat Barbara gestern ab 10 Uhr telefoniert?
Barbara hat gestern \textit{ab 10 Uhr nach New York} telefoniert.
?? Barbara hat gestern \textit{nach New York} ab 10 Uhr telefoniert.

Result (IF)

\textbf{(2,0) Source Temporal3 \textgreater Goal}

\textbf{A.1.20.11 Source Temporal3 – Source}

\textbf{A.1.20.11.1 Informational Focus}

Michael hat (gestern) \textit{ab 10 Uhr aus Venedig} berichtet.
Michael has (yesterday) from 10 o'clock on from Venice reported
'(Yesterday, )Michael reported from Venice from 10 o'clock on.'

Aus welcher Stadt hat Michael gestern ab 10 Uhr berichtet?
Michael hat (gestern) \textit{ab 10 Uhr aus Venedig} berichtet.
?

Ab wann hat Michael gestern aus Venedig berichtet?
Michael hat (gestern) \textit{ab 10 Uhr aus Venedig} berichtet.
Michael hat (gestern) \textit{aus Venedig} \textit{ab 10 Uhr} berichtet.

Result (IF)

\textbf{(1,0) Source Temporal3 \textgreater Source}

\textbf{A.1.20.12 Source Temporal3 – Path}

\textbf{A.1.20.12.1 Informational Focus}

Michael ist gestern \textit{ab 10 Uhr über die Autobahn} hierher gefahren
Michael is yesterday \textit{from 10 o'clock on on the freeway} \textit{to here} driven
'Yesterday, Michael raced on the freeway from 10 o'clock on to come here.'

Ab wann ist Michael gestern \textit{über die Autobahn} hierher gefahren?
\textbf{Michael ist gestern \textit{ab 10 Uhr über die Autobahn} hierher gefahren}
Michael is gestern \textit{ab 10 Uhr} \textit{über die Autobahn} hierher gefahren

Worüber / Über welche Strecke ist Michael gestern \textit{ab 10 Uhr} hierher gefahren?
\textbf{Michael ist gestern \textit{über die Autobahn} \textit{ab 10 Uhr} hierher gefahren}
Michael is gestern \textit{über die Autobahn} \textit{ab 10 Uhr} hierher gefahren
* Michael is gestern \textit{über die Autobahn} \textit{ab 10 Uhr} hierher gefahren
Result (IF)

(3,1) Source Temporal3 > Path

A.1.20.13 Source Temporal3 – Malefactive

A.1.20.13.1 Informational Focus

Michael ist gestern ab 10 Uhr gegen Ralph gefahren.
Michael is yesterday from 10 o'clock on against Ralph driven
'Yesterday, Michael raced against Ralph from 10 o'clock on.'

Ab wann ist Michael gestern gegen Ralph gefahren?
Michael ist gestern gegen Ralph ab 10 Uhr gefahren.

Gegen wen ist Michael gestern ab 10 Uhr gefahren?
Michael ist gestern gegen Ralph ab 10 Uhr gefahren.

Result (IF)

(1,1) Source Temporal3 > Malefactive

A.1.20.14 Source Temporal3 – Means

A.1.20.14.1 Informational Focus

Michael ist gestern ab 10 Uhr mit dem roten Ferrari gefahren.
Michael is yesterday from 10 o'clock on with the red Ferrari driven.
'Yesterday, Michael raced with the red Ferrari from 10 o'clock on.'

Mit was ist Michael gestern ab 10 Uhr gefahren?
Michael ist gestern mit dem roten Ferrari ab 10 Uhr gefahren.
* Michael ist gestern mit dem roten Ferrari gefahren.

Ab wann ist Michael gestern mit dem roten Ferrari gefahren?
Michael ist gestern mit dem roten Ferrari ab 10 Uhr gefahren.

Result (IF)

(3,1) Source Temporal3 > Means

A.1.20.15 Source Temporal3 – Duration Temporal1

A sentence like

* Die Krügers sind ab 1984 für drei Wochen in Urlaub gefahren
  The Krüger(pl) are since 1984 for three weeks in vacation gone.

is not grammatical. It seems the two roles are not compatible.
A.1.20.16 Source Temporal3 – Duration Temporal2

A.1.20.16.1 Informational Focus

Helmuth ist die 1000 m ab 1995 in 7 min gelaufen.
Helmuth is the 1000 m from 1995 on in 7 min run
'Helmuth ran the 1000 m in 7m from 1995 on.'

Ab wann ist Helmuth die 1000 m in 7 min gelaufen?
Helmuth ist die 1000 m ab 1995 in 7 min gelaufen.
Helmuth ist die 1000 m in 7 min ab 1995 gelaufen.

In welcher Zeit ist Helmuth die 1000 m ab 1985 gelaufen?
Helmuth ist die 1000 m ab 1995 in 7 min gelaufen.
* Helmuth ist die 1000 m in 7 min ab 1995 gelaufen.

Result (IF)

(3,1) Source Temporal3 > Duration Temporal2

A.1.20.17 Source Temporal3 – Duration Temporal3

A.1.20.17.1 Informational Focus

Krügers sind ab 1998 zwei Wochen lang in Urlaub gefahren.
Krügers are from 1998 on two weeks long in vacation driven
'From 1998 on, Krügers went for a two weeks vacation.'

Ab wann sind Krüger zwei Wochen lang in Urlaub gefahren?
Krügers sind ab 1998 zwei Wochen lang in Urlaub gefahren.
Krügers sind zwei Wochen lang ab 1998 in Urlaub gefahren.

Wie lange sind Krügers ab 1998 in Urlaub gefahren?
Krügers sind ab 1998 zwei Wochen lang in Urlaub gefahren.
* Krügers sind zwei Wochen lang ab 1998 in Urlaub gefahren.

Result (IF)

(3,1) Source Temporal3 > Duration Temporal3

A.1.20.18 Source Temporal3 – Source Temporal1

For semantic reasons, two Source Temporals cannot be combined.

A.1.20.19 Source Temporal3 – Source Temporal2

For semantic reasons two Source Temporals cannot be combined.
A.1.21 Past Temporal ("vor" + time interval)

A.1.21.1 Past Temporal – Temporal

These two PPs cannot be combined. But note, that it is possible to say:

Ich war im Kino am Dienstag vor 8 Tagen.
I was in the cinema on Tuesday 8 days ago.
I was in the cinema a week before Tuesday.

But here the complex "am Dienstag vor 8 Tagen" defines one single point in time. So "vor 8 Tagen" modifies, specifies the TempP and not the whole sentence.

A.1.21.2 Past Temporal – Benefactive

A.1.21.2.1 Informational Focus

Michael ist vor drei Tagen für Ferrari gefahren.
Michael is three days ago for Ferrari driven
'Michael raced for Ferrari three days ago.'

Für wen ist Michael vor drei Tagen gefahren?
Michael ist vor drei Tagen für Ferrari gefahren.
? Michael ist für Ferrari vor drei Tagen gefahren.

Wann ist Michael für Ferrari gefahren?
Michael ist für drei Tagen für Ferrari gefahren.
Michael ist für Ferrari vor drei Tagen gefahren.

Result (IF)

(1.1) Past Temporal > Benefactive

A.1.21.3 Past Temporal – Reason

A.1.21.3.1 Informational Focus

Michael ist vor 3 Tagen wegen des großen Preises gefahren.
Michael is 3 days ago because of the Grand Prix driven
'Michael raced because of the Grand Prix three days ago.'

Warum ist Michael vor 3 Tagen gefahren?
Michael ist vor 3 Tagen wegen des großen Preises gefahren.
?? Michael ist wegen des großen Preises vor 3 Tagen gefahren.

Wann ist Michael wegen des großen Preises fahren?
Michael ist vor 3 Tagen wegen des großen Preises gefahren.
Michael ist wegen des großen Preises vor 3 Tagen gefahren.
Result (IF)

(2,1) Past Temporal > Reason

A.1.21.4 Past Temporal – Locative

A.1.21.4.1 Informational Focus

Michael ist vor 3 Tagen in Monte Carlo gefahren.
Michael is three days ago in Monte Carlo driven
'Michael raced in Monte Carlo three days ago.'

Wo wird Michael in 3 Tagen gefahren?
Michael ist vor 3 Tagen in Monte Carlo gefahren.
? Michael ist in Monte Carlo vor 3 Tagen gefahren.

Wann ist Michael in Monte Carlo gefahren?
Michael ist vor 3 Tagen in Monte Carlo gefahren.
Michael ist in Monte Carlo vor 3 Tagen gefahren.

Result (IF)

(1,0) Past Temporal > Locative

A.1.21.5 Past Temporal – Instrumental

A.1.21.5.1 Informational Focus

Er hat vor drei Jahren mit Tusche gezeichnet.
He has three years ago with indian ink drawn
'He drew with indian ink three years ago.'

Womit hat Van Gogh vor drei Jahren gezeichnet?
Er hat vor drei Jahren mit Tusche gezeichnet.
* Er hat mit Tusche vor drei Jahren gezeichnet.

Wann hat Van Gogh mit Tusche gezeichnet?
** Er hat vor drei Jahren mit Tusche gezeichnet.
?? Er hat mit Tusche vor drei Jahren gezeichnet.

Result (IF)

(3,1) Past Temporal > Instrumental

A.1.21.6 Past Temporal – Manner

A.1.21.6.1 Informational Focus

Michael ist vor drei Tagen auf rasante Art gefahren.
Michael is three days ago in a speedy way driven
'Michael raced in a speedy way three days ago.'
Wie ist Michael vor drei Tagen gefahren?
Michael ist vor drei Tagen auf rasante Art gefahren.
* Michael ist auf rasante Art vor drei Tagen gefahren.

Wann ist Michael auf rasante Art gefahren?
Michael ist vor drei Tagen auf rasante Art gefahren.
Michael ist auf rasante Art vor drei Tagen gefahren.

Result (IF)

(3,1) Past Temporal > Manner

A.1.21.7 Past Temporal – Comitative

A.1.21.7.1 Informational Focus

Michael ist vor drei Tagen mit Rubens gefahren.
Michael is three days ago with Rubens driven
'Michael raced with Rubens three days ago.'

Mit wem ist Michael vor drei Tagen gefahren?
Michael ist vor drei Tagen mit Rubens gefahren.
? Michael ist mit Rubens vor drei Tagen gefahren.

Wann ist Michael mit Rubens gefahren?
Michael ist vor drei Tagen mit Rubens gefahren.
Michael ist mit Rubens vor drei Tagen gefahren.

Result (IF)

(1,0) Past Temporal > Comitative

A.1.21.8 Past Temporal – Evidential

A.1.21.8.1 Informational Focus

Michael ist gemäß Ralph vor drei Tagen gefahren.
Michael is according to Ralph three days ago driven
'According to Ralph, Michael raced three days ago.'

Gemäß wem ist Michael vor drei Tagen (nach Hamburg, in Monte Carlo) gefahren?
Michael ist gemäß Ralph vor drei Tagen gefahren.
Michael ist vor drei Tagen gemäß Ralph gefahren.

Wann ist Michael gemäß Ralph gefahren?
Michael ist gemäß Ralph vor drei Tagen gefahren.
? Michael ist vor drei Tagen gemäß Ralph gefahren.

Result (IF)

(1,1) Evidential > Past Temporal
A.1.21.9 Past Temporal – Matter

A.1.21.9.1 Informational Focus

Prof. Schmidt hat vor drei Tagen über Keilschrift gesprochen.

'Prof. Schmidt talked about cuneiform script three days ago.'

Wann hat Prof. Schmidt über Keilschrift gesprochen?

Prof. Schmidt hat vor drei Tagen über Keilschrift gesprochen.

Über was hat Prof. Schmidt vor drei Tagen gesprochen?

Prof. Schmidt hat vor drei Tagen über Keilschrift gesprochen.

Result (IF)

(2,1) Past Temporal > Matter

A.1.21.10 Past Temporal – Goal

A.1.21.10.1 Informational Focus

Barbara hat vor zwei Stunden nach New York telefoniert.

'Barbara made a phone call to New York two hours ago.'

Wann hat Barbara nach New York telefoniert?

Barbara hat vor zwei Stunden nach New York telefoniert.

Wohin hat Barbara vor zwei Stunden telefoniert?

Barbara hat vor zwei Stunden nach New York telefoniert.

Result (IF)

(1,1) Past Temporal > Goal

A.1.21.11 Past Temporal – Source

A.1.21.11.1 Informational Focus

Michael hat vor drei Monaten aus Venedig berichtet.

'Michael reported from Venice three months ago.'

Aus welcher Stadt hat Michael vor drei Monaten berichtet?

Michael hat vor drei Monaten aus Venedig berichtet.

Result (IF)
Wann hat Michael aus Venedig berichtet?
Michael hat vor drei Monaten aus Venedig berichtet.
Michael hat aus Venedig vor drei Monaten berichtet.

Result (IF)

(1,0) Past Temporal > Source

A.1.21.12 Past Temporal – Path

A.1.21.12.1 Informational Focus

Michael ist vor einer Stunde über die Autobahn hierher gefahren
'Michael went across the freeway an hour ago, to come here.'

Wann ist Michael über die Autobahn hierher gefahren?
Michael ist vor einer Stunde über die Autobahn hierher gefahren
Michael ist über die Autobahn vor einer Stunde hierher gefahren

Worüber / Über welche Strecke ist Michael vor einer Stunde hierher gefahren?
Michael ist vor einer Stunde über die Autobahn hierher gefahren
?? Michael ist über die Autobahn vor einer Stunde hierher gefahren

Result (IF)

(2,1) Past Temporal > Path

A.1.21.13 Past Temporal – Malefactive

A.1.21.13.1 Informational Focus

Michael ist vor drei Tagen gegen Ralph gefahren.
'Michael raced against Ralph three days ago.'

Wann ist Michael gegen Ralph gefahren?
Michael ist vor drei Tagen gegen Ralph gefahren.
Michael ist gegen Ralph vor drei Tagen gefahren.

Gegen wen ist Michael vor drei Tagen gefahren?
Michael ist vor drei Tagen gegen Ralph gefahren.
?? Michael ist gegen Ralph vor drei Tagen gefahren.

Result (IF)

(1,1) Past Temporal > Malefactive
A.1.21.14 Past Temporal – Means

A.1.21.14.1 Informational Focus

Michael ist vor 3 Tagen mit dem roten Ferrari gefahren.
Michael is three days ago with the red Ferrari driven
'Michael raced with the red Ferrari three days ago.'

Mit was ist Michael vor 3 Tagen gefahren?
Michael ist vor 3 Tagen mit dem roten Ferrari gefahren.
?? Michael ist mit dem roten Ferrari vor 3 Tagen gefahren.

Wann ist Michael mit dem roten Ferrari gefahren?
Michael ist vor 3 Tagen mit dem roten Ferrari gefahren.
Michael ist mit dem roten Ferrari vor 3 Tagen gefahren.

Result (IF)

(2,1) Past Temporal > Means

A.1.21.15 Past Temporal – Duration Temporal1

A.1.21.15.1 Informational Focus

Sie sind vor drei Jahren für zwei Wochen nach Teneriffa gefahren.
They are three years ago for two weeks to Tenerife driven
'They made a two weeks trip to Tenerife three years ago.'

Für wie lange sind die Krügers vor drei Jahren nach Teneriffa gefahren?
Sie sind vor drei Jahren für zwei Wochen nach Teneriffa gefahren.
?? Sie sind für zwei Wochen vor drei Jahren nach Teneriffa gefahren.

Wann sind die Krügers für zwei Wochen nach Teneriffa gefahren?
Sie sind vor drei Jahren für zwei Wochen nach Teneriffa gefahren.
Sie sind für zwei Wochen vor drei Jahren nach Teneriffa gefahren.

Result (IF)

(1,1) Past Temporal > Duration Temporal1

A.1.21.16 Past Temporal – Duration Temporal2

A.1.21.16.1 Informational Focus

Helmuth ist die 1000 m vor 10 Jahren in 7 min gelaufen.
Helmuth is the 1000 m 10 years ago in 7 min run
'Helmuth ran the 1000 m in 7 min 10 years ago.'

Wann ist Helmuth die 1000 m in 7 min gelaufen?
Helmuth ist die 1000 m vor 10 Jahren in 7 min gelaufen.
Helmuth ist die 1000 m in 7 min vor 10 Jahren gelaufen.
In welcher Zeit ist Helmuth die 1000 m vor 10 Jahren gelaufen?
Helmuth ist die 1000 m vor 10 Jahren in 7 min gelaufen.
?? Helmuth ist die 1000 m in 7 min vor 10 Jahren gelaufen.

Result (IF)

(2,0) Past Temporal > Duration Temporal2

A.1.21.17 Past Temporal – Duration Temporal3

A.1.21.17.1 Informational Focus

Sie haben vor Hundert Jahren drei Wochen lang gefeiert.
They have 100 years ago three weeks long celebrated
'A hundred years ago, they celebrated for three weeks.'

Wann haben die Mainzer drei Wochen lang gefeiert?
Sie haben vor Hundert Jahren drei Wochen lang gefeiert.
Sie haben drei Wochen lang vor Hundert Jahren gefeiert.

Wie lange haben die Mainzer vor Hundert Jahren gefeiert?
Sie haben vor Hundert Jahren drei Wochen lang gefeiert.
? Sie haben drei Wochen lang vor Hundert Jahren gefeiert.

Result (IF)

(1,1) Past Temporal > Duration Temporal3

A.1.21.18 Past Temporal – Source Temporal1

For semantic reasons these two roles are not compatible.

* Ich habe vor zwei Jahren seit zwei Stunden gearbeitet.
  I have before two years since two hours worked.

A.1.21.19 Past Temporal – Source Temporal2

For semantic reasons these two roles cannot be combined:

* Ich habe vor zwei Jahren seit 7 Uhr gearbeitet.
  I have before two years since 7 o'clock worked.

Seit – PPs are incompatible with past expressions!

A.1.21.20 Past Temporal – Source Temporal3

Contrary to the two above cases we can combine Past Temporals with Source Temporal3:

Ich habe vor drei Tagen ab 7 Uhr gearbeitet.
I have before three days since 7 o'clock worked.
'Three days ago I started to work at 7 o'clock.'
A.1.21.20.1 Informational Focus

Er hat vor drei Tagen ab 7 Uhr gearbeitet.
He has three days ago from 7 o'clock on worked
'He worked from 7 o'clock on three days ago.'

Wann hat Hans ab 7 Uhr gearbeitet?
Er hat vor drei Tagen ab 7 Uhr gearbeitet.
Er hat ab 7 Uhr vor drei Tagen gearbeitet.

? Ab wann hat Hans vor zwei Jahren gearbeitet?
Er hat vor drei Tagen ab 7 Uhr gearbeitet.
? Er hat ab 7 Uhr vor drei Tagen gearbeitet.

Result (IF)

(1,1) Past Temporal > Source Temporal

A.1.22 Future Temporal ("in" + time interval)

A.1.22.1 Future Temporal – Temporal

These two PPs cannot be combined. But note, that it is possible to say:

Ich gehe ins Kino am Dienstag in 8 Tagen.
I go into the cinema on Tuesday in 8 days.
'I will go to the cinema a week after Tuesday.'

But as in the case of the "vor"-PP, the "in"-PP does not modify the event, but the temporal PP.

A.1.22.2 Future Temporal – Benefactive

A.1.22.2.1 Informational Focus

Michael wird in drei Tagen für Ferrari fahren.
Michael will in three days for Ferrari drive
'Michael will race for Ferrari in three days.'

Für wen wird Michael in drei Tagen fahren?
Michael wird in drei Tagen für Ferrari fahren.
? Michael wird für Ferrari in drei Tagen fahren.

Wann wird Michael für Ferrari fahren?
Michael wird in drei Tagen für Ferrari fahren.
Michael wird für Ferrari in drei Tagen fahren.

Result (IF)

(1,1) Future Temporal > Benefactive
A.1.22.3 Future Temporal – Reason

A.1.22.3.1 Informational Focus

Michael wird in 3 Tagen wegen des großen Preises fahren.

Michael will in three days because of the Grand Prix drive
'Michael will race because of the Grand Prix in three days.'

Warum wird Michael in 3 Tagen fahren?
Michael wird in 3 Tagen wegen des großen Preises fahren.

Wann wird Michael wegen des großen Preises fahren?
Michael wird wegen des großen Preises in 3 Tagen fahren.

Result (IF)

(2,1) Future Temporal > Reason

A.1.22.4 Future Temporal – Locative

A.1.22.4.1 Informational Focus

Michael wird in 3 Tagen in Monte Carlo fahren.

Michael will in three days in Monte Carlo drive
'Michael will race in Monte Carlo in three days.'

Wo wird Michael in 3 Tagen fahren?
Michael wird in 3 Tagen in Monte Carlo fahren.

Wann wird Michael in Monte Carlo fahren?
Michael wird in 3 Tagen in Monte Carlo fahren.

Result (IF)

(1,0) Future Temporal > Locative

A.1.22.5 Future Temporal – Instrumental

A.1.22.5.1 Informational Focus

Hans wird das Schiff in zwei Tagen mit Sekt taufen.

Hans will the ship in two days with Champaign baptize
'Hans will baptize the ship with Champaign in two days.'

Womit wird Hans das Schiff in zwei Tagen taufen?
Er wird es in zwei Tagen mit Sekt taufen.

Er wird es mit Sekt in zwei Tagen taufen.
Wann wird Hans das Schiff mit Sekt taufen?
Er wird es in zwei Tagen mit Sekt taufen.
Er wird es mit Sekt in zwei Tagen taufen.

Result (IF)
(2,1) Future Temporal > Instrumental

A.1.22.6 Future Temporal – Manner
A.1.22.6.1 Informational Focus

Michael wird in drei Tagen auf rasante Art fahren.  
'Michael will in three days in a speedy way drive'

Wie wird Michael in drei Tagen fahren?
Michael wird in drei Tagen auf rasante Art fahren. 
?? Michael wird auf rasante Art in drei Tagen fahren.

Wann wird Michael auf rasante Art fahren?
Michael wird in drei Tagen auf rasante Art fahren.  
Michael wird auf rasante Art in drei Tagen fahren.

Result (IF)
(3,1) Future Temporal > Manner

A.1.22.7 Future Temporal – Comitative
A.1.22.7.1 Informational Focus

Michael wird in drei Tagen mit Rubens fahren.  
'Michael will in three days with Rubens drive'

Mit wem wird Michael in drei Tagen fahren?  
Michael wird in drei Tagen mit Rubens fahren. 
?? Michael wird mit Rubens in drei Tagen fahren.

Wann wird Michael mit Rubens fahren?
Michael wird in drei Tagen mit Rubens fahren.  
Michael wird mit Rubens in drei Tagen fahren.

Result (IF)
(1,0) Future Temporal > Comitative
A.1.22.8 Future Temporal – Evidential

A.1.22.8.1 Informational Focus

Given the fact, that there is no witness of a future event, one could expect some kind of non compatibility between these two adjuncts. But I don't feel any problems with the judgement of these sentences. They don't even seem to be odd. You could always furnish them with a background that renders them even semantically possible. This raises the question, whether the incompatibility we found in other cases is always due to semantic effects.

Michael wird gemäß Ralph in drei Tagen fahren.
Michael will according to Ralph in three days drive
'According to Ralph, Michael will race in three days.'

Gemäß wem wird Michael in drei Tagen (nach Hamburg, in Monte Carlo) fahren?
Michael wird gemäß Ralph in drei Tagen fahren.
Michael wird in drei Tagen gemäß Ralph fahren.

Wann wird Michael gemäß Ralph fahren?
Michael wird gemäß Ralph in drei Tagen fahren.
?? Michael wird in drei Tagen gemäß Ralph fahren.

Result (IF)

(2,1) Evidential > Future Temporal

A.1.22.9 Future Temporal – Matter

A.1.22.9.1 Informational Focus

Prof. Schmidt wird in drei Tagen über Keilschrift sprechen.
Prof. Schmidt will in three days about cuneiform script talk
'Prof. Schmidt will talk about cuneiform script in three days.'

Wann wird Prof. Schmidt über Keilschrift sprechen?
Prof. Schmidt wird in drei Tagen über Keilschrift sprechen.
Prof. Schmidt wird über Keilschrift in drei Tagen sprechen.

Über was wird Prof. Schmidt in drei Tagen sprechen?
Prof. Schmidt wird in drei Tagen über Keilschrift sprechen.
?? Prof. Schmidt wird über Keilschrift in drei Tagen sprechen.

Result (IF)

(2,1) Future Temporal > Matter
A.1.22.10 Future Temporal – Goal

A.1.22.10.1 Informational Focus

Barbara wird in zwei Stunden nach New York telefonieren.  
Barbara will in two hours to New York call  
'Barbara will make a phone call to New York in two hours.'

Wann wird Barbara nach New York telefonieren?
Barbara wird in zwei Stunden nach New York telefonieren.  
Barbara wird nach New York in zwei Stunden telefonieren.  
Wohin wird Barbara in zwei Stunden telefonieren?
Barbara wird in zwei Stunden nach New York telefonieren.  

Result (IF)

(1,1) Future Temporal > Goal

A.1.22.11 Future Temporal – Source

A.1.22.11.1 Informational Focus

Michael wird in drei Monaten aus Venedig berichten.  
Michael will in three months from Venice report  
'Michael will report from Venice in three months.'

Aus welcher Stadt wird Michael in drei Monaten berichten?
Michael wird in drei Monaten aus Venedig berichten.  
? Michael wird aus Venedig in drei Monaten berichten.

Wann wird Michael aus Venedig berichten?
Michael wird in drei Monaten aus Venedig berichten.  
Michael wird aus Venedig in drei Monaten berichten.

Result (IF)

(1,0) Future Temporal > Source

A.1.22.12 Future Temporal – Path

A.1.22.12.1 Informational Focus

Michael wird in einer Stunde über die Autobahn hierher gefahren  
Michael will in one hour on the freeway here drive  
'Michael will drive on the freeway in one hour to come here.'

Wann wird Michael über die Autobahn hierher fahren?
Michael wird in einer Stunde über die Autobahn hierher gefahren  
Michael wird über die Autobahn in einer Stunde hierher gefahren
Worüber / Über welche Strecke wird Michael in einer Stunde hierher fahren?
Michael wird in einer Stunde über die Autobahn hierher fahren
?? Michael wird über die Autobahn in einer Stunde hierher fahren

Result (IF)

(2,1) Future Temporal > Path

A.1.22.13 Future Temporal – Malefactive

A.1.22.13.1 Informational Focus

Michael wird in drei Tagen gegen Ralph fahren.
Michael will in three days against Ralph drive
'Michael will race against Ralph in three days.'

Wann wird Michael gegen Ralph fahren?
Michael wird in drei Tagen gegen Ralph fahren.

Gegen wen wird Michael in drei Tagen fahren?
Michael wird in drei Tagen gegen Ralph fahren.
?? Michael wird gegen Ralph in drei Tagen fahren.

Result (IF)

(1,1) Future Temporal > Malefactive

A.1.22.14 Future Temporal – Means

A.1.22.14.1 Informational Focus

Michael wird in 3 Tagen mit dem roten Ferrari fahren.
Michael will in three days with the red Ferrari drive
'Michael will race with the red Ferrari in three days.'

Mit was wird Michael in 3 Tagen fahren?
Michael wird in 3 Tagen mit dem roten Ferrari fahren.
?? Michael wird mit dem roten Ferrari in 3 Tagen fahren.

Wann wird Michael mit dem roten Ferrari fahren?
Michael wird in 3 Tagen mit dem roten Ferrari gefahren.
Michael wird mit dem roten Ferrari in 3 Tagen fahren.

Result (IF)

(2,1) Future Temporal > Means
A.1.22.15 Future Temporal – Duration Temporal1

A.1.22.15.1 Informational Focus

Krügers werden in zwei Monaten für drei Wochen nach Teneriffa fahren.
Krügers will in two months or three weeks to Tenerife drive
'The Krüger family will go to Tenerife for a three weeks trip in two months.'

Wann werden Krügers für drei Wochen nach Teneriffa fahren?
Sie werden in zwei Monaten für drei Wochen nach Teneriffa fahren.
Sie werden für drei Wochen in zwei Monaten nach Teneriffa fahren.

(Für) wie lange werden Krügers in zwei Monaten nach Teneriffa fahren?
Sie werden in zwei Monaten für drei Wochen nach Teneriffa fahren?
? Sie werden für drei Wochen in zwei Monaten nach Teneriffa fahren.

Result (IF)

(1,1) Future Temporal > Duration Temporal1

A.1.22.16 Future Temporal – Duration Temporal2

A.1.22.16.1 Informational Focus

Der ICE wird die Strecke in vier Jahren in 3 Stunden schaffen.
The ICE will the distance in four years in three hours manage
'The ICE will make the distance in three hours in four years.'

Wann wird der ICE die Strecke in 3 Stunden schaffen?
Der ICE wird die Strecke in vier Jahren in 3 Stunden schaffen.
Der ICE wird die Strecke in 3 Stunden in vier Jahren schaffen.

In welcher Zeit wird der ICE die Strecke in vier Jahren schaffen?
Der ICE wird die Strecke in vier Jahren in 3 Stunden schaffen?
? Der ICE wird die Strecke in 3 Stunden in vier Jahren schaffen.

Result (IF)

(1,0) Future Temporal > Duration Temporal2

A.1.22.17 Future Temporal – Duration Temporal3

A.1.22.17.1 Informational Focus

Die Mainzer werden in Hundert Jahren vier Wochen lang feiern.
The Mainzians will in hundred years four weeks long celebrate
'The people in Mainz will celebrate for four weeks in a hundred years.'

Wann werden die Mainzer vier Wochen lang feiern?
Sie werden in Hundert Jahren vier Wochen lang feiern.
Sie werden vier Wochen lang in Hundert Jahren feiern.
Wie lange werden die Mainzer in Hundert Jahren feiern? Sie werden in Hundert Jahren vier Wochen lang feiern. ?? Sie werden vier Wochen lang in Hundert Jahren feiern.

Result (IF)

(2,1) Future Temporal > Duration Temporal3

A.1.22.18 Future Temporal – Source Temporal1

Sentences like

* Hans wird in 10 Jahren seit 10 Stunden arbeiten.

show the incompatibility of the two roles.

A.1.22.19 Future Temporal – Source Temporal2

Here we find also incompatibility between the two roles:

* Hans wird in 10 Jahren seit 8 Uhr arbeiten.

A.1.22.20 Future Temporal – Source Temporal3

A.1.22.20.1 Informational Focus

Ab wann wird Hans in drei Tagen arbeiten?
Er wird in drei Tagen ab 7 Uhr arbeiten.
? Er wird ab 7 Uhr in drei Tagen arbeiten.

Wann wird Hans ab 7 Uhr arbeiten?
Er wird in drei Tagen ab 7 Uhr arbeiten.
Er wird ab 7 Uhr in drei Tagen arbeiten.

Result (IF)

(1,1) Future Temporal > Source Temporal3

A.1.22.21 Future Temporal – Past Temporal

For semantic reasons it seems clear that these two role cannot be combined.
A.2 Prepositional Objects

A.2.1 LPO – Locative Prepositional Object

A.2.1.1 LPO – Temporal

A.2.1.1.1 Quantifier Scope

Claudia was a super model. Her job was wearing expensive clothes and lying on sofas.

Claudia ist an mindestens einem Tag auf jedem Sofa gelegen.
Claudia is on at least one day on every sofa lain
‘Claudia lay on every sofa on at least one day.’

Claudia ist an mindestens einem Tag auf jedem Sofa gelegen.
∃ (time) ∀ (place)

? ∀ (place) ∃ (time)

Claudia ist auf mindestens einem Sofa an jedem Tag gelegen.
∃ (place) ∀ (time)
∀ (time) ∃ (place)

Claudia ist auf jedem Sofa an mindestens einem Tag gelegen.
∀ (place) ∃ (time)
∃ (time) ∀ (place)

Claudia ist auf jedem Tag auf mindestens einem Sofa gelegen.
∀ (time) ∃ (place)
∃ (place) ∀ (time)

Nachfeld

* Claudia ist an mindestens einem Tag gelegen auf jedem Sofa.
∃ (time) ∀ (place)
∀ (place) ∃ (time)

Claudia ist auf mindestens einem Sofa gelegen an jedem Tag.
* ∃ (place) ∀ (time)
∀ (time) ∃ (place)

Claudia ist auf jedem Sofa gelegen an mindestens einem Tag.
?? ∀ (place) ∃ (time)
∃ (time) ∀ (place)

* Claudia ist an jedem Tag gelegen auf mindestens einem Sofa.
∀ (time) ∃ (place)
∃ (place) ∀ (time)
Result (QS)

\[(1,2,0,0,0,0) \quad \text{Temporal} > \text{LPO}\]

A.2.1.2 Pair-List Reading

→ Auf welchem Sofa ist Claudia an jedem Tag gelegen?
   An welchem Tag ist Claudia auf jedem Sofa gelegen?

Result (PLR)

\text{Temporal} > \text{LPO}

A.2.1.3 Informational Focus

Claudia ist am Donnerstag auf dem roten Sofa gelegen.
Claudia is on Thursday on the red sofa lain.
'Claudia lay on the red sofa on Thursday.'

Wo ist Claudia am Donnerstag gelegen?
Claudia ist am Donnerstag \textit{auf dem roten Sofa} gelegen.
?? Claudia ist \textit{auf dem roten Sofa} am Donnerstag gelegen.

Wann ist Claudia auf dem roten Sofa gelegen?
\textbf{Claudia ist am Donnerstag auf dem roten Sofa gelegen.}
Claudia ist auf dem roten Sofa \textit{am Donnerstag} gelegen.

Result (IF)

\[(2,1) \quad \text{Temporal} > \text{LPO}\]

A.2.1.2 LPO – Benefactive

A.2.1.2.1 Quantifier Scope

Claudia was working for several photographers. She had to pose for them on different sofas.

Claudia ist für mindestens einen Photographen auf jedem Sofa gelegen.
Claudia is for at least one photographer on every sofa lain
'Claudia lay for at least one photographer on every sofa.'

Claudia ist für mindestens einen Photographen auf jedem Sofa gelegen.
\exists \ (\text{beneficiary}) \ \forall \ (\text{place})
\forall \ (\text{place}) \ \exists \ (\text{beneficiary})

Claudia ist auf mindestens einem Sofa für jeden Photographen gelegen.
\exists \ (\text{place}) \ \forall \ (\text{beneficiary})
?? \ \forall \ (\text{beneficiary}) \ \exists \ (\text{place})
Claudia ist auf jedem Sofa für mindestens einen Photografen gelegen.
∀ (place) ∃ (beneficiary)
?
∃ (beneficiary) ∀ (place)

Claudia ist für jeden Photografen auf mindestens einem Sofa gelegen.
∀ (beneficiary) ∃ (place)
∃ (place) ∀ (beneficiary)

Nachfeld

* Claudia ist für mindestens einen Photografen gelegen auf jedem Sofa.
∃ (beneficiary) ∀ (place)
∀ (place) ∃ (beneficiary)

Claudia ist auf mindestens einem Sofa gelegen für jeden Photografen.
* ∃ (place) ∀ (beneficiary)
∀ (beneficiary) ∃ (place)

Claudia ist auf jedem Sofa gelegen für mindestens einen Photografen.
* ∀ (place) ∃ (beneficiary)
∃ (beneficiary) ∀ (place)

* Claudia ist für jeden Photografen gelegen auf mindestens einem Sofa.
∀ (beneficiary) ∃ (place)
∃ (place) ∀ (beneficiary)

Result (QS)

(2,1,0,0,0,0)  LPO > Benefactive

A.2.1.2.2 Pair-List Reading

Auf welchem Sofa ist Claudia für jeden Photografen gelegen?

→ Für welchen Photografen ist Claudia auf jedem Sofa gelegen.

Result (PLR)

LPO > Benefactive

A.2.1.2.3 Informational Focus

Claudia ist für Karl auf dem roten Sofa gelegen.
Claudia is for Karl on the red sofa lain
'Claudia lay for Karl on the red sofa.'

Für wen ist Claudia auf dem roten Sofa gelegen?
Sie ist für Karl auf dem roten Sofa gelegen.
Sie ist auf dem roten Sofa für Karl gelegen.
Auf welchem Sofa ist Claudia für Karl gelegen.
Sie ist für Karl auf dem roten Sofa gelegen.
? Sie ist auf dem roten Sofa für Karl gelegen.

Result (IF)

(1,1) Benefactive > LPO

A.2.1.3 LPO – Reason

A.2.1.3.1 Quantifier Scope
The agency hired Claudia for various purposes. Every order required a different setting to present
the individual style of the clothes. For the long, neo-baroque dress, Karl preferred the golden sofa,
while for the post-neandertalian he ordered her to lie on the wooden sofa. For some jobs, they
performed shooting on all sofas.

Claudia ist wegen mindestens einem Auftrag auf jedem Sofa gelegen.
Claudia is because of at least one job on every sofa lain
'Claudia lay on every sofa because of at least job.'

Claudia ist wegen mindestens einem Auftrag auf jeder Liege gelegen.
∃ (reason) ∀ (place)
∀ (place) ∃ (reason)

Claudia ist auf mindestens einer Liege wegen jedem Auftrag gelegen.
∃ (place) ∀ (reason)
? ∀ (reason) ∃ (place)

Claudia ist auf jeder Liege wegen mindestens einem Auftrag gelegen.
∀ (place) ∃ (reason)
? ∃ (reason) ∀ (place)

Claudia ist wegen jedem Auftrag auf mindestens einer Liege gelegen.
∀ (reason) ∃ (place)
∃ (place) ∀ (reason)

Nachfeld

* Dass Claudia wegen mindestens einem Auftrag gelegen ist auf jeder Liege, habe ich
gesehen.
∃ (reason) ∀ (place)
∀ (place) ∃ (reason)

Dass Claudia auf mindestens einer Liege gelegen ist wegen jedem Auftrag, habe ich
gesehen.
∃ (place) ∀ (reason)
∀ (reason) ∃ (place)
Dass Claudia auf jeder Liege gelegen ist wegen mindestens einem Auftrag, habe ich gesehen.
\[ \forall \text{(place)} \exists \text{(reason)} \]
\[ \exists \text{(reason)} \forall \text{(place)} \]

* Dass Claudia wegen jedem Auftrag gelegen ist auf mindestens einer Liege, habe ich gesehen.
\[ \forall \text{(reason)} \exists \text{(place)} \]
\[ \exists \text{(place)} \forall \text{(reason)} \]

Result (QS)

\begin{align*}
(0.5,0.5,0.5,0,0,0) & \quad \text{LPO} > \text{Reason} \\
\end{align*}

A.2.1.3.2 Pair-List Reading

→ Wegen welchem Auftrag ist sie auf jeder Liege gelegen?

Auf welcher Liege ist sie wegen jedem Auftrag gelegen?

Result (PLR)

\begin{align*}
\text{LPO} & > \text{Reason} \\
\end{align*}

A.2.1.3.3 Informational Focus

Sie ist wegen Karls Auftrag auf der roten Liege gelegen.
'She is because of Karl's order on the red sofa lain.'

Wegen welchem Auftrag ist sie auf der roten Liege gelegen?
Sie ist auf der roten Liege wegen Karls Auftrag gelegen.
\[ \text{Sie ist wegen Karls Auftrag auf der roten Liege gelegen.} \]

Auf welcher Liege ist sie wegen Karls Auftrag gelegen?
?? Sie ist \emph{auf der roten Liege} wegen Karls Auftrag gelegen.
Sie ist wegen Karls Auftrag \emph{auf der roten Liege} gelegen.

Result (IF)

\begin{align*}
(2,1) & \quad \text{Reason} > \text{LPO} \\
\end{align*}

A.2.1.4 LPO – Locative

A.2.1.4.1 Quantifier Scope

George, the photographer, went with Claudia to his big atelier with 4 big rooms. The company "Genussvolles Räkeln" from Oberliegen had sponsored 6 different sofas for the photos. George arranged some of the sofas in every room and poor little Claudia had to pose all day on them. On the red sofa she had to lie in three different rooms! She was really tired that evening!
Claudia hat in mindestens einem Raum auf jedem Sofa gelegen.
Claudia has in at least one room on every sofa lain
'Claudia lay on every sofa in at least one room.'

Claudia hat in mindestens einem Raum auf jedem Sofa gelegen.
\[ \exists \text{(room)} \ \forall \ (\text{place}) \]
\[ \forall \ (\text{place}) \ \exists \ (\text{room}) \]

Claudia hat auf mindestens einem Sofa in jedem Raum gelegen.
\[ \exists \ (\text{place}) \ \forall \ (\text{room}) \]
\[ \forall \ (\text{room}) \ \exists \ (\text{place}) \]

Claudia hat auf jedem Sofa in mindestens einem Raum gelegen.
\[ \forall \ (\text{place}) \ \exists \ (\text{room}) \]
\[ \exists \ (\text{room}) \ \forall \ (\text{place}) \]

Claudia hat in jedem Raum auf mindestens einem Sofa gelegen.
\[ \forall \ (\text{room}) \ \exists \ (\text{place}) \]
\[ ? \ \exists \ (\text{place}) \ \forall \ (\text{room}) \]

Nachfeld

* Dass Claudia in mindestens einem Raum lag auf jedem Sofa, erzählte mir der Butler.
\[ \exists \ (\text{room}) \ \forall \ (\text{place}) \]
\[ \forall \ (\text{place}) \ \exists \ (\text{room}) \]

Dass Claudia auf mindestens einem Sofa lag in jedem Raum, erzählte mir der Butler.
\[ \exists \ (\text{place}) \ \forall \ (\text{room}) \]
\[ \forall \ (\text{room}) \ \exists \ (\text{place}) \]

Dass Claudia auf jedem Sofa lag in mindestens einem Raum, erzählte mir der Butler.
\[ \forall \ (\text{place}) \ \exists \ (\text{room}) \]
\[ \exists \ (\text{room}) \ \forall \ (\text{place}) \]

* Dass Claudia in jedem Raum lag auf mindestens einem Sofa, erzählte mir der Butler.
\[ \forall \ (\text{room}) \ \exists \ (\text{place}) \]
\[ \exists \ (\text{place}) \ \forall \ (\text{room}) \]

Result (QS)

(0,0.5,0,0,0,0) Locative > LPO

A.2.1.4.2 Pair-List Reading

In welchem Raum lag Claudia auf jedem Sofa?

Auf welchem Sofa lag Claudia in jedem Raum?
Result (PLR)

Locative ? LPO

A.2.1.4.3 Informational Focus

Sie lag im grünen Salon auf dem roten Sofa.
She lay in the green salon on the red sofa
'She lay on the red sofa in the green salon.'

In welchem Raum lag Claudia auf dem roten Sofa?
She lay on the red sofa in the green salon.

Auf welchem Sofa lag Claudia im grünen Salon?

Sie lag auf dem roten Sofa im grünen Salon.

A.2.1.5 LPO – Instrumental

A.2.1.5.1 Quantifier Scope

Claudia had a maid who washed her clothes. This maid, Georgia, was very neurotic and obsessed by statistics. She wrote down which clothes hung on which line with which pin. (in her later life she collected legs of spiders in her cell of the asylum).

Die Perücke ist mit mindestens einer Wäscheklammer an jeder Leine gehangen.
The wig is with at least one peg on every laundry line hung
'The wig hang on every laundry line with at least one peg.'

Die Perücke ist mit mindestens einer Wäscheklammer an jeder Leine gehangen.
∃ (instrument) ∀ (place)
∀ (place) ∃ (instrument)

Die Perücke ist an mindestens einer Leine mit jeder Wäscheklammer gehangen.
∃ (place) ∀ (instrument)
∃ (place) ∀ (instrument)

Die Perücke ist an jedes Leine mit mindestens einer Wäscheklammer gehangen.
∀ (place) ∃ (instrument)
∃ (place) ∀ (place)

Die Perücke ist mit jeder Wäscheklammer an mindestens einer Leine gehangen.
∀ (instrument) ∃ (place)
∃ (place) ∀ (instrument)
Nachfeld

* Dass die Perücke mit mindestens einer Wäscheklammer gehangen hatte an jeder Leine, schien ihm besonders interessant.
  ∃ (instrument) ∀ (place)
  ∀ (place) ∃ (instrument)

Dass die Perücke an mindestens einer Leine gehangen hatte mit jeder Wäscheklammer, schien ihm besonders interessant.
  ∀ (place) ∃ (instrument)
  ∃ (instrument) ∀ (place)

Dass die Perücke an jeder Leine gehangen hatte mit mindestens einer Wäscheklammer, schien ihm besonders interessant.
  ∀ (place) ∃ (instrument)
  ∃ (instrument) ∀ (place)

* Dass die Perücke mit jeder Wäscheklammer gehangen hatte an mindestens einer Leine, schien ihm besonders interessant.
  ∀ (instrument) ∃ (place)
  ∃ (place) ∀ (instrument)

Result (QS)

(0.5,0.5,0,0,0,0) LPO > Instrumental

A.2.1.5.2 Pair-List Reading

→ Mit welcher Klammer hing die Perücke auf jeder Leine?
   Auf welcher Leine hing die Perücke mit jeder Klammer?

Result (PLR)

LPO > Instrumental

A.2.1.5.3 Informational Focus

Die Perücke hing mit der grünen Wäscheklammer auf der roten Leine.
The wig hung with the green pin on the red laundry line.
'The wig hang on the red laundry line with the green pin.'

Mit welcher Wäscheklammer hing die Perücke auf der roten Leine?
Sie hing mit der grünen Wäscheklammer auf der roten Leine.
Sie hing auf der roten Leine mit der grünen Wäscheklammer.

Auf welcher Leine hing die Perücke mit der grünen Wäscheklammer?
Sie hing mit der grünen Wäscheklammer auf der roten Leine.
?? Sie hing auf der roten Leine mit der grünen Wäscheklammer.
Result (IF)

(2,1) Instrumental > LPO

A.2.1.6 LPO – Manner

A.2.1.6.1 Quantifier Scope

Claudia ist auf mindestens eine Art auf jedem Sofa gelegen. 
Claudia is in at least one manner on every sofa lain 'Claudia lay on every sofa in at least one manner.'

Claudia ist auf mindestens eine Art auf jedem Sofa gelegen. 
∃ (manner) ∀ (place) 
∀ (place) ∃ (manner)

Claudia ist auf mindestens einem Sofa auf jede Art gelegen. 
∃ (place) ∀ (manner) 
?? ∀ (manner) ∃ (place)

Claudia ist auf jedem Sofa auf mindestens eine Art gelegen. 
∀ (place) ∃ (manner) 
?? ∃ (manner) ∀ (place)

Claudia ist auf jede Art auf mindestens einem Sofa gelegen. 
∀ (manner) ∃ (place) 
∃ (place) ∀ (manner)

Result (QS)

(2,2,0,0,1,0) LPO > Manner

A.2.1.6.2 Pair-List Reading

→ Auf welche Art lag Claudia auf jedem Sofa? 
Auf welchem Sofa lag Claudia auf jede Art?

Result (PLR)

LPO > Manner

A.2.1.6.3 Informational Focus

Claudia ist in aufreizender Art auf dem Sofa gelegen. 
Claudia is in provoking manner on the sofa lain 'Claudia lay on the sofa in a provoking manner.'

Wo ist Claudia in aufreizender Art gelegen? 
? Claudia ist auf *dem Sofa* in aufreizender Art gelegen. 
Claudia is in aufreizender Art *auf dem Sofa* gelegen.
Wie ist Claudia auf dem Sofa gelegen?
Claudia ist auf dem Sofa in aufreizender Art gelegen.
Claudia ist in aufreizender Art auf dem Sofa gelegen.

Result (IF)

(1,1) Manner > LPO

A.2.1.7 LPO – Comitative

A.2.1.7.1 Quantifier Scope

Claudia ist mit mindestens einer Kollegin auf jedem Sofa gelegen.
Claudia is with at least one colleague on every sofa lain
'Claudia lay on every sofa with at least one colleague.'

Claudia ist mit mindestens einer Kollegin auf jedem Sofa gelegen.
∃ (comitative) ∀ (place)
 ∀ (place) ∃ (comitative)

Claudia ist auf mindestens einem Sofa mit jeder Kollegin gelegen.
∃ (place) ∀ (comitative)
? ∀ (comitative) ∃ (place)

Claudia ist auf jedem Sofa mit mindestens einer Kollegin gelegen.
∀ (place) ∃ (comitative)
∃ (comitative) ∀ (place)

Claudia ist mit jeder Kollegin auf mindestens einem Sofa gelegen.
∀ (comitative) ∃ (place)
? ∃ (place) ∀ (comitative)

Nachfeld

* Dass Claudia mit mindestens einer Kollegin gelegen ist auf jedem Sofa, hat sie nicht sonderlich gestört.
∃ (comitative) ∀ (place)
∀ (place) ∃ (comitative)

Dass Claudia auf mindestens einem Sofa gelegen ist mit jeder Kollegin, hat sie nicht sonderlich gestört.
∃ (place) ∀ (comitative)
? ∀ (comitative) ∃ (place)

Dass Claudia auf jedem Sofa gelegen ist mit mindestens einer Kollegin, hat sie nicht sonderlich gestört.
∀ (place) ∃ (comitative)
? ∃ (comitative) ∀ (place)
* Dass Claudia mit jeder Kollegin gelegen ist auf mindestens einem Sofa, hat sie nicht sonderlich gestört.

\[ \forall \text{(comitative)} \exists \text{(place)} \]
\[ \exists \text{(place)} \forall \text{(comitative)} \]

Result (QS)

\[ (0.5,0,0,0.5,1,0) \quad \text{LPO > Comitative} \]

A.2.1.7.2 Pair-List Reading

→ Auf welchem Sofa lag sie mit jeder Kollegin?

→ Mit welcher Kollegin lag sie auf jedem Sofa?

Result (PLR)

Comitative ? LPO

A.2.1.7.3 Informational Focus

Claudia lag mit Cindy auf dem roten Sofa.
Claudia lay with Cindy on the red sofa
Claudia lay on the red sofa with Cindy.'

Mit wem lag Claudia auf dem roten Sofa?
Sie lag mit Cindy auf dem roten Sofa.
Sie lag auf dem roten Sofa mit Cindy.

Auf welchem Sofa lag Claudia mit Cindy?
Sie lag mit Cindy auf dem roten Sofa.
?? Sie lag auf dem roten Sofa mit Cindy.

Result (IF)

\[ (2,1) \quad \text{Comitative > LPO} \]

A.2.1.8 LPO – Evidential

A.2.1.8.1 Quantifier Scope

When the owner of the atelier returned from his long journey he found all sofas in disorder. Claudia denied that she had lain on all of them. But the owner had three loyal servants who had been watching Claudia during the shooting. The told him on which sofa they had seen Claudia.

Claudia ist gemäß mindestens einem Diener auf jedem Sofa gelegen.
Claudia is according to at least one servant on every sofa lain
'According to at least one servant, Claudia lay on every sofa.'
Claudia ist gemäß mindestens einem Diener auf jedem Sofa gelegen.
\( \exists (\text{witness}) \ \forall (\text{place}) \)

? \( \forall (\text{place}) \ \exists (\text{witness}) \)

Claudia ist auf mindestens einem Sofa gemäß jeden Dieners gelegen.
\( \exists (\text{place}) \ \forall (\text{witness}) \)

\( \forall (\text{witness}) \ \exists (\text{place}) \)

Claudia ist auf jedem Sofa gemäß mindestens einem Diener gelegen.
\( \forall (\text{place}) \ \exists (\text{witness}) \)

\( \exists (\text{witness}) \ \forall (\text{place}) \)

Claudia ist gemäß jeden Dieners auf mindestens einem Sofa gelegen.
\( \forall (\text{witness}) \ \exists (\text{place}) \)

?? \( \exists (\text{place}) \ \forall (\text{witness}) \)

Result (QS)

(1,2,0,0,1,0) Evidential > LPO

A.2.1.8.2 Pair-List Reading

Gemäß welchem Diener lag sie auf jedem Sofa?

→ Auf welchem Sofa lag sie gemäß jedem Diener?

Result (PLR)

Evidential > LPO

A.2.1.8.3 Informational Focus

Sie lag gemäß Rudolf auf dem roten Sofa.
She lay according to Rudolf on the red sofa
'According to Rudolf, she lay on the red sofa.'

Gemäß wem lag sie auf dem roten Sofa?

Sie lag gemäß Rudolf auf dem roten Sofa.
Sie lag auf dem roten Sofa gemäß Rudolf.

Auf welchem Sofa lag sie gemäß Rudolf?

Sie lag gemäß Rudolf auf dem roten Sofa.
* Sie lag auf dem roten Sofa gemäß Rudolf.

Result (IF)

(3,1) Evidential > LPO

A.2.1.9 LPO – Matter

These roles seem to be incompatible.
A.2.1.10 LPO – Goal

These two roles seem definitely incompatible. An argumental locative PP is only possible with at stative verb like "lie", whereas the directionals need an action verb.

A.2.1.11 LPO – Source

These two roles seem definitely incompatible. An argumental locative PP is only possible with at stative verb like "lie", whereas the directionals need an action verb.

A.2.1.12 LPO – Path

These two roles seem definitely incompatible. An argumental locative PP is only possible with at stative verb like "lie", whereas the Directionals need an action verb.

A.2.2 DPO – Directional Prepositional Object

A.2.2.1 DPO – Temporal

A.2.2.1.1 Quantifier Scope

Er hat die Kopien an mindestens einem Tag auf jeden Tisch gelegt.
He has the handouts on at least one day on every table put
'He put the handouts on every table on at least one day.'

Er hat die Kopien an mindestens einem Tag auf jeden Tisch gelegt.
∃ (time) ∀ (goal)
* ∀ (goal) ∃ (time)

Er hat die Kopien auf mindestens einen Tisch an jedem Tag gelegt.
∃ (goal) ∀ (time)
∀ (time) ∃ (goal)

Er hat die Kopien auf jeden Tisch an mindestens einem Tag gelegt.
∀ (goal) ∃ (time)
∃ (time) ∀ (goal)

Er hat die Kopien an jedem Tag auf mindestens einen Tisch gelegt.
∀ (time) ∃ (goal)
* ∃ (goal) ∀ (time)

Result (QS)

(3,3,0,0,0,0) Temporal > DPO
A.2.2.1.2 Pair-List Reading

An welchem Tag legte er die Kopien auf jeden Tisch?

Auf welchen Tisch legte er die Kopien an jedem Tag?

Result (PLR)
Temporal > DPO

A.2.2.1.3 Informational Focus

Der Briefträger hat die Zeitung am Dienstag auf die Treppe gelegt.
The postman has the newspaper on Tuesday on the stairs laid 'Hans laid the newspaper on the stairs on Tuesday.'

Wohin hat der Briefträger die Zeitung am Dienstag gelegt?
Hans hat sie am Dienstag auf die Treppe gelegt.
* Hans hat sie auf die Treppe am Dienstag gelegt.

Wann hat der Briefträger die Zeitung auf die Treppe gelegt?
Er hat sie am Dienstag auf die Treppe gelegt.
Er hat sie auf die Treppe am Dienstag gelegt.

Result (IF)
(3,1) Temporal > DPO

A.2.2.2 DPO – Benefactive

A.2.2.2.1 Quantifier Scope

Er hat Handouts für mindestens einen Prof. auf jeden Tisch gelegt.
He has handouts for at least one professor on every table put 'He put the handouts on every table for at least one professor.'

Er hat Handouts für mindestens einen Prof. auf jeden Tisch gelegt.
∃ (beneficiary) ∀ (goal)
?

Er hat Handouts auf mindestens einen Tisch für jeden Prof. gelegt.
∀ (goal) ∃ (beneficiary)

Er hat Handouts auf jeden Tisch für mindestens einen Prof. gelegt.
∀ (goal) ∃ (beneficiary)
∃ (beneficiary) ∀ (goal)

Er hat Handouts für jeden Prof. auf mindestens einen Tisch gelegt.
∀ (beneficiary) ∃ (goal)
?

Result (QS)

(1,1,0,0,0,1) Benefactive > DPO

A.2.2.2.2 Pair-List Reading

Für welchen Prof. legte er Handouts auf jeden Tisch?

→ Auf welchen Tisch legte er Handouts für jeden Prof.?

Result (PLR)

Benefactive > DPO

A.2.2.2.3 Informational Focus

Der Student hat die Kreide für Prof. Wuselig auf das Pult gelegt.
The student has the chalk for Prof. Wuselig on the desk placed
'The student placed the chalk on the desk for Prof. Wuselig.'

Wohin hat der Student die Kreide für Prof. Wuselig gelegt?
Er hat sie für Prof. Wuselig auf das Pult gelegt.
?? Er hat sie auf das Pult für Prof. Wuselig gelegt.

Für wen hat der Student die Kreide auf das Pult gelegt?
Er hat sie für Prof. Wuselig auf das Pult gelegt.
Er hat sie auf das Pult für Prof. Wuselig gelegt.

Result (IF)

(2,1) Benefactive > DPO

A.2.2.3 DPO – Reason

A.2.2.3.1 Quantifier Scope

Er hat Keime in mindestens eine Petrischale wegen jeder Krankheit gelegt.
He has germs in at least one Petri dish because of every disease put
'He put germs because of every disease in at least one Petri dish.'

Er hat Keime in mindestens eine Petrischale wegen jeder Krankheit gelegt.
∃ (goal) ∀ (reason)
∀ (reason) ∃ (goal)

Er hat Keime wegen mindestens einer Krankheit in jede Petrischale gelegt.
∃ (reason) ∀ (goal)
? ∀ (goal) ∃ (reason)

Er hat Keime wegen jeder Krankheit in mindestens eine Petrischale gelegt.
∀ (reason) ∃ (goal)
? ∃ (goal) ∀ (reason)
Er hat Keime in jede Petrischale wegen mindestens einer Krankheit gelegt.
∀ (goal) ∃ (reason)
∃ (reason) ∀ (goal)

Nachfeld

Er hat Handouts auf mindestens einen Tisch gelegt wegen jeder Vorlesung.
* ∃ (goal) ∀ (reason)
 ∀ (reason) ∃ (goal)

* Er hat Handouts wegen mindestens einer Vorlesung gelegt auf jeden Tisch.
 ∃ (reason) ∀ (goal)
 ∀ (goal) ∃ (reason)

* Er hat Handouts wegen jeder Vorlesung gelegt auf mindestens einen Tisch.
 ∀ (reason) ∃ (goal)
 ∃ (goal) ∀ (reason)

Er hat Handouts auf jeden Tisch gelegt wegen mindestens einer Vorlesung.
* ∀ (goal) ∃ (reason)
 ∃ (reason) ∀ (goal)

Result (QS)

(0.5,0.5,0,0,0,0) +1 Reason > DPO

A.2.2.3.2 Pair-List Reading

Wegen welcher Vorlesung legte er Handout auf jeden Tisch?
→ Auf welchen Tisch legte er Handouts wegen jeder Vorlesung?

Result (PLR)

Reason > DPO

A.2.2.3.3 Informational Focus

Er hat wegen der Feiertage den Weihnachtsbaum auf den Tisch gestellt.  
He has because of the holidays the Christmas tree on the table placed  
'He placed the Christmas tree on the table because of the holidays.'

Warum hat er den Weihnachtsbaum auf den Tisch gestellt?  
Er hat ihn wegen der Feiertage auf den Tisch gestellt.  
Er hat ihn auf den Tisch wegen der Feiertage gestellt.

Wohin hat er den Weihnachtsbaum wegen der Feiertage gestellt?  
?? Er hat ihn auf den Tisch wegen der Weihnachtstage gestellt.  
Er hat ihn wegen der Weihnachtstage auf den Tisch gestellt.
Result (IF)

(2,1) Reason > DPO

A.2.2.4 DPO – Locative

A.2.2.4.1 Quantifier Scope

There is a train going from Amsterdam to Milan. The waiter in the dining car has the task to put flowers on table. But the number of tables he decorates in this way depends on the country, the train is in.

Der Schaffner hat Blumen in mindestens einem Land auf jeden Tisch gestellt.
The conductor has flowers in at least one country on every table put 'The conductor put flowers on every table in at least one country.'

Der Schaffner hat Blumen in mindestens einem Land auf jeden Tisch gestellt.
\exists (place) \forall (goal)
* \forall (goal) \exists (place)

Der Schaffner hat Blumen auf mindestens einen Tisch in jedem Land gestellt.
\exists (goal) \forall (place)
\forall (place) \exists (goal)

Der Schaffner hat Blumen auf jeden Tisch in mindestens einem Land gestellt.
\forall (goal) \exists (place)
\exists (place) \forall (goal)

Der Schaffner hat Blumen in jedem Land auf mindestens einen Tisch gestellt.
\forall (place) \exists (goal)
? \exists (goal) \forall (place)

Result (QS)

(3,1,0,0,0,1) Locative > DPO

A.2.2.4.2 Pair-List Reading

→ Auf welchen Tisch hat er Blumen in jedem Land gestellt?

In welchem Land hat er Blumen auf jeden Tisch gestellt?

Result (PLR)

Locative > DPO

A.2.2.4.3 Informational Focus

Er hat die Kreide in der Aula auf das Pult gelegt.
He has the chalk in the lecture room on the desk put 'He put the chalk on the desk in the lecture room.'
Wohin hat er die Kreide in der Aula gelegt?
Er hat sie in der Aula auf das Pult gelegt.
* Er hat sie auf das Pult in der Aula gelegt.

Wo hat er die Kreide auf das Pult gelegt?
Er hat sie auf das Pult in der Aula gelegt.
Er hat sie in der Aula auf das Pult gelegt.

Result (IF)

(3,1) Locative > DPO

A.2.2.5 DPO – Instrumental

A.2.2.5.1 Quantifier Scope

Der Kellner hat Kartoffeln mit mindestens einem Löffel auf jeden Teller gelegt.
The waiter has potatoes with at least one spoon on every plate put
'The waiter put potatoes on every plate with at least one spoon.'

Der Kellner hat Kartoffeln mit mindestens einem Löffel auf jeden Teller gelegt.
∃ (instrument) ∀ (goal)
∀ (goal) ∃ (instrument)

Der Kellner hat Kartoffeln auf mindestens einen Teller mit jedem Löffel gelegt.
∃ (goal) ∀ (instrument)
? ∀ (instrument) ∃ (goal)

Der Kellner hat Kartoffeln auf jeden Teller mit mindestens einem Löffel gelegt.
∀ (goal) ∃ (instrument)
∃ (instrument) ∀ (goal)

Der Kellner hat Kartoffeln mit jedem Löffel auf mindestens einen Teller gelegt.
∀ (instrument) ∃ (goal)
∃ (goal) ∀ (instrument)

Result (QS)

(1,0,0,0,0,0) DPO > Instrumental ?

A.2.2.5.2 Pair-List Reading

→ Mit welchem Löffel hat der Kellner Kartoffeln auf jeden Teller gelegt?
Auf welchen Teller hat der Kellner Kartoffeln mit jedem Löffel gelegt?

Result (PLR)

DPO > Instrumental
A.2.2.5.3 Informational Focus

Er hat die Kartoffeln mit der Gabel auf den Teller gelegt.
He has the potatoes with the fork on the plate placed
'He placed the potatoes on the plate with the fork.'

Wohin hat er die Kartoffeln mit der Gabel gelegt?
Er hat sie mit der Gabel auf den Teller gelegt.
?? Er hat sie auf den Teller mit der Gabel gelegt.

Womit hat er die Kartoffeln auf den Teller gelegt?
Er hat sie mit der Gabel auf den Teller gelegt.
Er hat sie auf den Teller mit der Gabel gelegt.

Result (IF)

(2,1) Instrumental > DPO

A.2.2.6 DPO – Manner

A.2.2.6.1 Quantifier Scope

Er hat die Kopien auf mindestens einen Tisch auf jede Art gelegt.
He has the handouts on at least one table in every way put
'He put the handouts in every way on at least one table.'

Er hat die Kopien auf mindestens einen Tisch auf jede Art gelegt.
∃ (goal) ∀ (manner)
?? ∀ (manner) ∃ (goal)

Er hat die Kopien auf mindestens eine Art auf jeden Tisch gelegt.
∃ (manner) ∀ (goal)
∀ (goal) ∃ (manner)

Er hat die Kopien auf jede Art auf mindestens einen Tisch gelegt.
∀ (manner) ∃ (goal)
∃ (goal) ∀ (manner)

Er hat die Kopien auf jeden Tisch auf mindestens eine Art gelegt.
∀ (goal) ∃ (manner)
? ∃ (manner) ∀ (goal)

Result (QS)

(2,1,0,0,0,0) DPO > Manner

A.2.2.6.2 Pair-List Reading

→ Auf welche Art hat er die Kopien auf jeden Tisch gelegt?

Auf welchen Tisch hat er die Kopien auf jede Art gelegt?
Result (PLR)

DPO > Manner

A.2.2.6.3 Informational Focus

Hans hat die Kopien auf seine ganz besondere Art auf den Tisch gelegt.
Hans has the handouts in his very special manner on the table put
'Hans put the handouts on the table in his very special manner.'

Wie hat Hans die Kopien auf den Tisch gelegt?
Hans hat die Kopien auf seine ganz besondere Art auf den Tisch gelegt.
Hans hat die Kopien auf den Tisch auf seine ganz besondere Art gelegt.

Wohin hat Hans die Kopien auf seine ganz besondere Art gelegt?
Er hat sie auf seine ganz besondere Art auf den Tisch gelegt.
Er hat sie auf den Tisch auf seine ganz besondere Art gelegt.

Result (IF)

(1,1) Manner > DPO

A.2.2.7 DPO – Comitative

A.2.2.7.1 Quantifier Scope

Er hat die Kopien mit mindestens einem Kollegen auf jeden Tisch gelegt.
He has the handouts with at least one colleague on every table put
'He put the handouts on every table with at least one colleague.'

Er hat die Kopien mit mindestens einem Kollegen auf jeden Tisch gelegt.
∃ (comitative) ∀ (goal)

Er hat die Kopien auf mindestens einen Tisch mit jedem Kollegen gelegt.
∀ (goal) ∃ (comitative)

Er hat die Kopien auf jeden Tisch mit mindestens einem Kollegen gelegt.
∀ (goal) ∃ (comitative)
∃ (comitative) ∀ (goal)

Er hat die Kopien mit jedem Kollegen auf mindestens einen Tisch gelegt.
∀ (comitative) ∃ (goal)
?? ∃ (goal) ∀ (comitative)

Result (QS)

(1,2,0,0,0,0) Comitative > DPO
A.2.2.7.2  Pair-List Reading

Mit welchem Kollegen hat er Kopien auf jeden Tisch gelegt?

→ Auf welchen Tisch hat er Kopien mit jedem Kollegen gelegt?

Result (PLR)

Comitative > DPO

A.2.2.7.3  Informational Focus

Franz hat das Büffet mit Thomas auf die Kommode gestellt.
Franz has the buffet with Thomas on the chest of drawers placed
'Franz placed the buffet on the chest of drawers with Thomas.'

Mit wem hat Hans das Büffet auf die Kommode gestellt?
Er hat das Büffet mit Thomas auf die Kommode gestellt.
Er hat das Büffet auf die Kommode mit Thomas gestellt.

Wohin hat Hans das Büffet mit Thomas gestellt?
Hans hat das Büffet mit Thomas auf die Kommode gestellt.
* Hans hat das Büffet auf die Kommode mit Thomas gestellt.

Result (IF)

(3,1) Comitative > DPO

A.2.2.8 DPO – Evidential

A.2.2.8.1  Quantifier Scope

Er hat die Kopien gemäß mindestens eines Studenten auf jeden Tisch gelegt.
He has the handouts according to at least one student on every table put
'According to at least one student, he put the handouts on every table.'

Er hat die Kopien gemäß mindestens eines Studenten auf jeden Tisch gelegt.
∃ (witness) ∀ (goal)
* ∀ (goal) ∃ (witness)

Er hat die Kopien auf mindestens einen Tisch gemäß jedes Studenten gelegt.
∃ (witness) ∀ (goal)
∀ (goal) ∃ (witness)

Er hat die Kopien auf jeden Tisch gemäß mindestens eines Studenten gelegt.
∀ (witness) ∃ (goal)
∃ (goal) ∀ (witness)

Er hat die Kopien gemäß jedes Studenten auf mindestens einen Tisch gelegt.
∀ (goal) ∃ (witness)
* ∃ (witness) ∀ (goal)
Result (QS)

\[
(3,3,0,0,0,1) \quad \text{Evidential > DPO}
\]

A.2.2.8.2 Pair-List Reading

→ Auf welchen Tisch hat er Kopien gemäß jedem Studenten gelegt?

Gemäß welchem Studenten hat er Kopien auf jeden Tisch gelegt?

Result (PLR)

\[
\text{Evidential > DPO}
\]

A.2.2.8.3 Informational Focus

John hat den Mikrospion gemäß Tanja auf das Radio gelegt.

'According to Tanja, John put the micro spy on the radio.'

Wohin hat John den Spion gemäß Tanja gelegt?

Er hat ihn gemäß Tanja auf das Radio gelegt.

Gemäß wem hat John den Spion auf das Radio gelegt?

Er hat ihn gemäß Tanja auf das Radio gelegt.

Er hat ihn auf das Radio gemäß Tanja gelegt.

Result (IF)

\[
(2,1) \quad \text{Evidential > DPO}
\]

A.2.2.9 DPO – Matter

These two roles seem to be incompatible.

A.2.2.10 DPO – Source

A.2.2.10.1 Quantifier Scope

Er hat Kopien auf mindestens einen Tisch von jedem Stapel gelegt.

'He put handouts from every stack onto at least one table.'

Er hat Kopien von mindestens einem Stapel auf jeden Tisch gelegt.

Er hat Kopien von mindestens einem Stapel auf jeden Tisch gelegt.

∃ (goal) ∀ (source)

∀ (source) ∃ (goal)
Er hat Kopien von jedem Stapel auf mindestens einen Tisch gelegt.
∀ (source) ∃ (goal)

? ∃ (goal) ∀ (source)

? Er hat Kopien auf jeden Tisch von mindestens einem Stapel gelegt.
∀ (goal) ∃ (source)
∃ (source) ∀ (goal)

Result (QS)

(0,1,0,0,0,0) Source > DPO

A.2.2.10.2 Pair-List Reading

Von welchem Stapel hat er Kopien auf jeden Tisch gelegt?

→ Auf welchen Tisch hat er Kopien von jedem Stapel gelegt?

Result (PLR)

Source > DPO

A.2.2.10.3 Informational Focus

Er hat die Hose vom Bett auf den Stuhl gelegt.
He has the trousers from the bed on the chair laid
'He laid the trousers from the bed onto the chair.'

Wohin hat er die Hosen vom Bett gelegt?
Er hat sie vom Bett auf den Stuhl gelegt.
?? Er hat sie auf den Stuhl vom Bett gelegt.

Von wo hat er die Hosen auf den Stuhl gelegt?
Er hat sie vom Bett auf den Stuhl gelegt.
Er hat sie auf den Stuhl vom Bett gelegt.

Result (IF)

(2,1) Source > DPO

A.2.2.11 DPO – Path

A.2.2.11.1 Quantifier Scope

(The PP with "über" in the sense of path as adverbial to an event with the verb "legen" (to put) is slightly degraded in German. The judgement becomes even more difficult, given the fact, that the "über" PP could be misunderstood as a (second) goal PP:

Er legte die Papiere über den Stuhl.
He put the papers on the chair.
But it is possible to get correct judgements by distinguishing these theta roles.

Peter had to copy some papers for the presentation of Prof. Schlauberger. Coming from the copy machine, he first arranged them by sorting them on some chairs and then put them on the tables.

Peter hat die Kopien auf mindestens einen Tisch über jeden Stuhl gelegt.
Peter has the copies on at least one table over every chair put 'Peter put the copies over every chair on at least one table.'

Peter hat die Kopien auf mindestens einen Tisch über jeden Stuhl gelegt.
∃ (goal) ∀ (path)

Peter hat die Kopien über mindestens einen Stuhl auf jeden Tisch gelegt.
∀ (path) ∃ (goal)
∀ (goal) ∃ (path)

Peter hat die Kopien über jeden Stuhl auf mindestens einen Tisch gelegt.
∀ (path) ∃ (goal)
∃ (goal) ∀ (path)

Peter hat die Kopien auf jeden Tisch über mindestens einen Stuhl gelegt.
∀ (goal) ∃ (path)

Result (QS)

(0.5,0.5,0,0,0,0) DPO > Path

A.2.2.11.2 Pair-List Reading

Auf welchen Tisch legte er sie über jeden Stuhl?

→ Über welchen Stuhl legte er sie auf jeden Tisch?

Result (PLR)

DPO > Path

A.2.2.11.3 Informational Focus

? Peter hat die Kopien über den Stuhl auf den Tisch gelegt.
Peter has the copies over the chair on(to) the table put 'Peter put the copies on the table over the chair.'

? Wohin hat er die Kopien über den Stuhl gelegt?
Er hat sie über den Stuhl auf den Tisch gelegt.
?? Er hat sie auf den Tisch über den Stuhl gelegt.
Worüber hat er die Kopien auf den Tisch gelegt?
Er hat sie über den Stuhl auf den Tisch gelegt.
Er hat sie auf den Tisch über den Stuhl gelegt.

Result (IF)

(2,0) Path > DPO

A.2.3 DPO2

A.2.3.1 DPO2 – Temporal

A.2.3.1.1 Quantifier Scope

Barbara worked part times in different offices. Her boy friend used to send her flowers quite frequently.

Er hat ihr Blumen an mindestens einem Tag in jedes Büro geschickt.
He has her flowers on at least one day in every office sent
'He sent her flowers into every office on at least one day.'

Er hat ihr Blumen an mindestens einem Tag in jedes Büro geschickt.
∃ (time) ∀ (goal)

∀ (goal) ∃ (time)

Er hat ihr Blumen in mindestens ein Büro an jedem Tag geschickt.
∃ (goal) ∀ (time)
∀ (time) ∃ (goal)

Er hat ihr Blumen in jedes Büro an mindestens einem Tag geschickt.
∀ (goal) ∃ (time)
∃ (time) ∀ (goal)

Er hat ihr Blumen an jedem Tag in mindestens ein Büro geschickt.
∀ (time) ∃ (goal)
* ∃ (goal) ∀ (time)

Result (QS)

(1,3,0,0,1,1) Temporal > DPO2

A.2.3.1.2 Pair-List Reading

An welchem Tag schickte er ihr Blumen an jedes Büro?
→ An welches Büro schickte er ihr Blumen an jedem Tag?

Result (PLR)

Temporal > DPO2
A.2.3.1.3 Informational Focus

Bernd hat ihr Blumen am Donnerstag ins Büro geschickt.
Bernd has her flowers on Thursday into the office sent
'Bernd sent her flowers into the office on Thursday.'

Wohin hat Bernd ihr die Blumen am Donnerstag geschickt?
Er hat sie ihr am Donnerstag ins Büro geschickt.
* Er hat sie ihr ins Büro am Donnerstag geschickt.

Wann hat er ihr die Blumen ins Büro geschickt?
Er hat sie ihr am Donnerstag ins Büro geschickt.
Er hat sie ihr ins Büro am Donnerstag geschickt.

Result (IF)

(3,1) Temporal > DPO2

A.2.3.2 DPO2 – Benefactive

A.2.3.2.1 Quantifier Scope

Every lower boss in the company had an affair with Barbara and ordered the secretary to send her flowers.

Die Sekretärin hat ihr für mindestens einen Chef in jedes Büro Blumen geschickt.
The secretary has her for at least one boss into every office flowers sent
'The secretary sent her flowers into every office for at least one boss.'

Die Sekretärin hat ihr für mindestens einen Chef in jedes Büro Blumen geschickt.
∃ (beneficiary) ∀ (goal)
? ∀ (goal) ∃ (beneficiary)

Die Sekretärin hat ihr in mindestens ein Büro für jeden Chef Blumen geschickt.
∃ (goal) ∀ (beneficiary)
∀ (beneficiary) ∃ (goal)

Die Sekretärin hat ihr in jedes Büro für mindestens einen Chef Blumen geschickt.
∀ (goal) ∃ (beneficiary)
∃ (beneficiary) ∀ (goal)

Die Sekretärin hat ihr für jeden Chef in mindestens ein Büro Blumen geschickt.
∀ (beneficiary) ∃ (goal)
?? ∃ (goal) ∀ (beneficiary)

Result (QS)

(1,2,0,0,0,1) Benefactive > DPO2
A.2.3.2.2 Pair-List Reading

Für welchen Chef hat Gloria in jedes Büro Blumen geschickt?

→ In welches Büro hat Gloria für jeden Chef Blumen geschickt?

Result (PLR)

Benefactive > DPO2

A.2.3.2.3 Informational Focus

Sie hat ihr Blumen für ihren Chef ins Büro geschickt.
'She sent flowers to her into the office for her boss.'

Wohin hat sie ihr Blumen für ihren Boss geschickt?
Sie hat ihr Blumen für ihren Boss ins Büro geschickt.
* Sie hat ihr Blumen ins Büro für ihren Boss geschickt.

Für wen hat sie ihr Blumen ins Büro geschickt?
Sie hat ihr Blumen für ihren Boss ins Büro geschickt.
Sie hat ihr Blumen ins Büro für ihren Boss geschickt.

Result (IF)

(3,1) Benefactive > DPO2

A.2.3.3 DPO2 – Reason

A.2.3.3.1 Quantifier Scope

Hans hat ihr wegen mindestens einem Anlass in jedes Büro Blumen geschickt.
'Hans sent flowers to her into every office because of at least one reason.'

Hans hat ihr wegen mindestens einem Anlass in jedes Büro Blumen geschickt.
∃ (reason) ∀ (goal)
∀ (goal) ∃ (reason)

Hans hat ihr in mindestens ein Büro wegen jedem Anlass Blumen geschickt.
∃ (goal) ∀ (reason)
∀ (reason) ∃ (goal)

Hans hat ihr in jedes Büro wegen mindestens einem Anlass Blumen geschickt.
∀ (goal) ∃ (reason)
∃ (reason) ∀ (goal)

Hans hat ihr wegen jedem Anlass in mindestens ein Büro Blumen geschickt.
∀ (reason) ∃ (goal)
? ∃ (goal) ∀ (reason)
Nachfeld

Hans hat ihr wegen mindestens einem Anlass Blumen geschickt in jedes Büro.
∃ (reason) ∀ (goal)
* ∀ (goal) ∃ (reason)

Hans hat ihr in mindestens ein Büro Blumen geschickt wegen jedem Anlass.
* ∃ (goal) ∀ (reason)
∀ (reason) ∃ (goal)

Hans hat ihr in jedes Büro Blumen geschickt wegen mindestens einem Anlass.
* ∀ (goal) ∃ (reason)
∃ (reason) ∀ (goal)

Hans hat ihr wegen jedem Anlass Blumen geschickt in mindestens ein Büro.
∀ (reason) ∃ (goal)
* ∃ (goal) ∀ (reason)

Result (QS)

(0,1,0,0,0,0) +1 Reason > DPO2

A.2.3.3.2 Pair-List Reading

Aus welchem Anlass schickt Hans ihr in jedes Büro Blumen?
In welches Büro schickte ihr Hans aus jedem Anlass Blumen?
Wegen welchem Auftrag schickte ihr Hans in jedes Büro Blumen?
→ In welches Büro schickte ihr Hans wegen jedem Auftrag Blumen?

Result (PLR)

Reason > DPO2

A.2.3.3.3 Informational Focus

Hans hat ihr aus Mitleid Blumen ins Krankenhaus geschickt.
Hans has her out of pity for flowers into the hospital sent 'Hans sent her flowers into the hospital out of pity.'

Wohin hat ihr Hans aus Mitleid Blumen geschickt?
Hans hat ihr aus Mitleid Blumen ins Krankenhaus geschickt.

Warum hat ihr Hans Blumen ins Krankenhaus geschickt?
Er hat ihr Blumen aus Mitleid ins Krankenhaus geschickt.
Er hat ihr Blumen ins Krankenhaus aus Mitleid geschickt.
A.2.3.4 DPO2 – Locative

It is difficult, not to get mixed up with the inclusive relation: "to be in London in the opera" versus "to go in London into the opera"

A.2.3.4.1 Quantifier Scope

John travelled from city to city sending messages to his friends all over the world with pigeons.

John hat die Tauben in mindestens einer Stadt in jede Himmelsrichtung geschickt.

John has the pigeons in at least one city (DAT) in every direction (AKK) sent
'John sent the pigeons into every direction in at least on city.'

John hat die Tauben in mindestens einer Stadt in jede Himmelsrichtung geschickt.
∃ (place) ∀ (goal)
?? ∀ (goal) ∃ (place)

John hat die Tauben in mindestens eine Himmelsrichtung in jeder Stadt geschickt.
∃ (goal) ∀ (place)
∀ (place) ∃ (goal)

John hat die Tauben in jede Himmelsrichtung in mindestens einer Stadt geschickt.
∀ (goal) ∃ (place)
∃ (place) ∀ (goal)

John hat die Tauben in jeder Stadt in mindestens eine Himmelsrichtung geschickt.
∀ (place) ∃ (goal)
* ∃ (goal) ∀ (place)

A.2.3.4.2 Pair-List Reading

In welcher Stadt hat John in jede Himmelsrichtung Tauben geschickt?

In welche Himmelsrichtung hat John in jeder Stadt Tauben geschickt?

A.2.3.4.3 Informational Focus

Hans hat ihr in London nach Österreich geschrieben.
Hans has her in London to Austria written
'Hans wrote letters to her in London, sending them to Austria.'
Wohin hat ihr Hans in London geschrieben?
Er hat ihr in London nach Österreich geschrieben.

Wo hat ihr Hans nach Österreich geschrieben?
Er hat ihr in London nach Österreich geschrieben.
Er hat ihr nach Österreich in London geschrieben.

Result (IF)

(1,1)  Locative > DPO2

A.2.3.5 DPO2 – Instrumental

A.2.3.5.1 Quantifier Scope
I want to distinguish instrumental role from means of transportation. Therefore, I have to construct the following example:

Captain Steward is a pilot whose task is to test various instruments of airplanes. In order to compare the instruments he performs several flights to Paris, Berlin and Prague with different instruments.

Er flog (die Maschine) mit mindestens einem Instrument in jede Stadt.
He flew (the plane) with at least one instrument into every city
'He flew the airplane into every city with at least one instrument.'

Er flog (die Maschine) mit mindestens einem Instrument in jede Stadt.
∃ (instrument) ∀ (goal)
∀ (goal) ∃ (instrument)

Er flog in mindestens eine Stadt mit jedem Instrument.
∃ (goal) ∀ (instrument)
? ∀ (instrument) ∃ (goal)

Er flog in jede Stadt mit mindestens einem Instrument.
∀ (goal) ∃ (instrument)
∃ (instrument) ∀ (goal)

Er flog mit jedem Instrument in mindestens eine Stadt.
∀ (instrument) ∃ (goal)
∃ (goal) ∀ (instrument)

Result (QS)

(1,0,0,0,0,0)  DPO2 > Instrumental ?

A.2.3.5.2 Pair-List Reading

→ Mit welchem Instrument flog er die Maschine in jede Stadt?
In welche Stadt flog er die Maschine mit jedem Instrument?
Result (PLR)

DPO2 > Instrumental

A.2.3.5.3 Informational Focus

Er steuerte die Maschine mittels Radargeräts nach London.
He steered the machine by means of a radar device to London
'He flew the plane to London by means of a radar device.'

Wohin steuerte er die Maschine mittels Radargeräts?
Er steuerte die Maschine nach London mittels Radargeräts.
'He flew the plane to London by means of a radar device.'

Mit was steuerte er die Maschine nach London?
Er steuerte die Maschine mittels Radargeräts nach London.

Result (IF)

(1,0) Instrumental > DPO2

A.2.3.6 DPO2 - Manner

A.2.3.6.1 Quantifier Scope

Susan travelled a lot around in the world and Max, who really loved her sent her letters to every town where she was, even for a short time. He used to send his letters in very different ways (by airmail, with pigeons, giving them to friends).

Er hat ihr die Briefe in mindestens eine Stadt auf jede Weise geschickt.
He has her the letters in at least one city in every way sent
'He sent her the letters in every way into at least one manner.'

Er hat ihr die Briefe in jede Stadt auf mindestens eine Weise geschickt.

∃ (goal) ∀ (manner)

? ∀ (manner) ∃ (goal)

Er hat ihr die Briefe auf mindestens eine Weise in jede Stadt geschickt.
∃ (manner) ∀ (goal)
∀ (goal) ∃ (manner)

Er hat ihr die Briefe auf jede Weise in mindestens eine Stadt geschickt.
∀ (manner) ∃ (goal)
∃ (goal) ∀ (manner)

Er hat ihr die Briefe in jede Stadt auf mindestens eine Weise geschickt.
∀ (goal) ∃ (manner)
?? ∃ (manner) ∀ (goal)
Result (QS)

(1,2,0,0,0,1) DPO2 > Manner

A.2.3.6.2 Pair-List Reading

In welche Stadt hat er ihr Briefe auf jede Weise geschickt?

→ Auf welche Weise hat er ihr Briefe in jede Stadt geschickt?

Result (PLR)

DPO2 > Manner

A.2.3.6.3 Informational Focus

Er hat Susanne die Briefe mit Express nach Salzburg geschickt.
He has Susanne the letters with express to Salzburg sent
'He sent Susanne the letters to Salzburg with express.'

Wie hat er Susanne die Briefe nach Salzburg geschickt?
Er hat sie ihr mit Express nach Salzburg geschickt.
Er hat sie ihr nach Salzburg mit Express geschickt.

Wohin hat er die Briefe mit Express geschickt?
? Er hat sie ihr nach Salzburg mit Express geschickt.
Er hat sie ihr mit Express nach Salzburg geschickt.

Result (IF)

(1,0) Manner > DPO2

A.2.3.7 DPO2 - Comitative

A.2.3.7.1 Quantifier Scope

Er hat ihr mit mindestens einem Kollegen in jedes Büro Blumen geschickt.
He has her with at least one colleague into every office flowers sent
'He sent her flowers into every office with at least one colleague.'

Er hat ihr mit mindestens einem Kollegen in jedes Büro Blumen geschickt.
∃ (comitative) ∀ (goal)

? ∀ (goal) ∃ (comitative)

Er hat ihr in mindestens ein Büro mit jedem Kollegen Blumen geschickt.
∃ (goal) ∀ (comitative)
∀ (comitative) ∃ (goal)

Er hat ihr in jedes Büro mit mindestens einem Kollegen Blumen geschickt.
∀ (goal) ∃ (comitative)
∃ (comitative) ∀ (goal)
Er hat ihr mit jedem Kollegen in mindestens ein Büro Blumen geschickt.
∀ (comitative) ∃ (goal)
∃ (goal) ∀ (comitative)

Result (QS)

(1,2,0,0,1,0) Comitative > DPO2

A.2.3.7.2 Nachfeld

Er hat ihr mit mindestens einem Kollegen Blumen geschickt in jedes Büro.
∃ (comitative) ∀ (goal)
* ∀ (goal) ∃ (comitative)

Er hat ihr in mindestens ein Büro Blumen geschickt mit jedem Kollegen.
?? ∃ (goal) ∀ (comitative)
∀ (comitative) ∃ (goal)

Er hat ihr in jedes Büro Blumen geschickt mit mindestens einem Kollegen.
* ∀ (goal) ∃ (comitative)
∃ (comitative) ∀ (goal)

Er hat ihr mit jedem Kollegen Blumen geschickt in mindestens ein Büro.
∀ (comitative) ∃ (goal)
∃ (goal) ∀ (comitative)

A.2.3.7.3 Pair-List Reading

→ In welches Büro schickt er ihr mit jedem Kollegen Blumen?
Mit welchem Kollegen schickte er ihr in jedes Büro Blumen?

Result (PLR)
Comitative > DPO2

A.2.3.7.4 Informational Focus

Peter hat mit Brigitte seinen Schwiegereltern nach Hamburg geschrieben.
Peter has with Brigitte to his parents in law to Hamburg written
'Peter wrote letters to his parents in law with Brigitte, sending them to Hamburg.'

Wohin hat er ihnen mit Brigitte geschrieben?
Er hat ihnen mit Brigitte nach Hamburg geschrieben.
?? Er hat ihnen nach Hamburg mit Brigitte geschrieben.

Mit wem hat er ihnen nach Hamburg geschrieben?
Er hat ihnen nach Hamburg mit Brigitte geschrieben.
Er hat ihnen mit Brigitte nach Hamburg geschrieben.
Result (IF)

(2,0) Comitative > DPO2

A.2.3.8 DPO2 – Evidential

A.2.3.8.1 Quantifier Scope

Er hat ihr gemäß mindestens eines Zeugens in jedes Büro Blumen geschickt.
He has her according to at least one witness into every office flowers sent
'According to at least one witness, he sent her flowers into every office.'

Er hat ihr gemäß mindestens eines Zeugens in jedes Büro Blumen geschickt.
∃ (witness) ∀ (goal)
∃ (goal) ∀ (witness)

Er hat ihr in mindestens ein Büro gemäß jedes Zeugens Blumen geschickt.
∃ (goal) ∀ (witness)
∀ (witness) ∃ (goal)

Er hat ihr in jedes Büro gemäß mindestens eines Zeugens Blumen geschickt.
∀ (goal) ∃ (witness)
∃ (witness) ∀ (goal)

Er hat ihr gemäß jedes Zeugens in mindestens ein Büro Blumen geschickt.
∀ (witness) ∃ (goal)
∃ (goal) ∀ (witness)

Result (QS)

(2,2,0,0,0,0) Evidential > DPO2

A.2.3.8.2 Pair-List Reading

Gemäß welchem Zeugen schickte er ihr in jedes Büro Blumen?

→ In welches Büro schickte er ihr gemäß jedem Zeugen Blumen?

Result (PLR)

Evidential > DPO2

A.2.3.8.3 Informational Focus

Er hat das Päckchen gemäß Gerda nach Mainz geschickt.
He has the package according to Gerda to Mainz sent
'According to Gerda, he sent the package to Mainz.'

Gemäß wem hat er das Päckchen nach Mainz geschickt?
Er hat das Päckchen gemäß Gerda nach Mainz geschickt.
Er hat das Päckchen nach gemäß Gerda geschickt?
Wohin hat er das Päckchen gemäß Gerda geschickt?

Er hat das Päckchen nach Mainz gemäß Gerda geschickt.

Er hat das Päckchen gemäß Gerda nach Mainz geschickt.

Result (IF)

(2,1) Evidential > DPO2

A.2.3.9 DPO2 – Matter

These two roles seem to be incompatible. A goal role can only be selected by a movement event, but a movement cannot have a matter. For English this means the impossibility of having the prepositions "about" and "into" as parts of different adjuncts in the same clause, as in a construction like " doing something about something into somewhere".

A.2.3.10 DPO2 – Source

A.2.3.10.1 Quantifier Scope

Fritz hat ihr Briefe von mindestens einem Ort an jede Adresse geschickt.
Fritz has her letters from at least one village/town to every address sent.

′Fritz sent her letter from at least one village to every address.'

Fritz hat ihr Briefe von mindestens einem Ort an jede Adresse geschickt.
∃ (source) ∀ (goal)
∀ (goal) ∃ (source)

Fritz hat ihr Briefe an mindestens eine Adresse von jedem Ort geschickt.
∃ (goal) ∀ (source)
∀ (source) ∃ (goal)

Fritz hat ihr Briefe an jede Adresse von mindestens einem Ort geschickt.
∀ (goal) ∃ (source)
∃ (source) ∀ (goal)

Fritz hat ihr Briefe von jedem Ort an mindestens eine Adresse geschickt.
∀ (source) ∃ (goal)
?? ∃ (goal) ∀ (source)

Result (QS)

(0,2,0,0,0,0) Source > DPO2

A.2.3.10.2 Pair-List Reading

→ An welche Adresse hat Fritz ihr Briefe von jedem Ort geschickt?

Von welchem Ort hat Fritz ihr Briefe an jede Adresse geschickt?
Fritz hat Susanne ein Paket von Hamburg nach Helgoland geschickt.
Fritz has Susanne a package from Hamburg to Helgoland sent
'The package was sent from Hamburg to Helgoland.'

Wohin hat Fritz Susanne das Paket von Hamburg geschickt?
Er hat es ihr von Hamburg nach Helgoland geschickt.

Aus welcher Stadt hat Fritz ihr das Paket nach Helgoland geschickt?
Er hat es ihr von Hamburg nach Helgoland geschickt.
Er hat es ihr nach Helgoland von Hamburg geschickt.

Hans ist in mindestens eine Stadt über jedes Dorf gefahren.
Hans is into at least one town over every village gone
'Hans travelled into at least one town over every village.'

Hans ist in mindestens eine Stadt über jedes Dorf gefahren.
∃ (goal) ∀ (path)
? ∀ (path) ∃ (goal)

Hans ist über mindestens ein Dorf in jede Stadt gefahren.
∃ (path) ∀ (goal)
∀ (goal) ∃ (path)

Hans ist über jedes Dorf in mindestens eine Stadt gefahren.
∀ (path) ∃ (goal)
∃ (goal) ∀ (path)

Hans ist in jede Stadt über mindestens ein Dorf gefahren.
∀ (goal) ∃ (path)
? ∃ (path) ∀ (goal)
A.2.3.11.2 Pair-List Reading

→ Über welches Dorf ist Hans in jede Stadt gefahren?
In welche Stadt ist Hans über jedes Dorf gefahren?

A.2.3.11.3 Informational Focus

Hans ist über Klein-Winternheim nach Worms gefahren.
Hans is over Klein-Winternheim to Worms gone
'Hans travelled through Klein-Winternheim to Worms.'

Wohin ist Hans über Klein-Winternheim gefahren?
Er ist über Klein-Winternheim nach Worms gefahren.
?? Er ist nach Worms über Klein-Winternheim gefahren.

Über welches Dorf ist Hans nach Worms gefahren?
Er ist über Klein-Winternheim nach Worms gefahren.
Er ist nach Worms über Klein-Winternheim gefahren.

A.2.3.12 DPO2 – Malefactive

A.2.3.12.1 Quantifier Scope

Michael and his competitors participated on various benefit cross country races with different routes. The starting point was always Paris, but the goal varied. In October it was Berlin, in November it was Rome and in December they went to Dakar.

Michael ist in mindestens eine Stadt gegen jeden Rivalen gefahren.
Michael is into at least one city against every opponent raced
'Michael raced against every opponent into at least one city.'

Michael ist in mindestens eine Stadt gegen jeden Rivalen gefahren.
∃ (goal) ∀ (opponent)

Michael ist gegen mindestens einen Rivalen in jede Stadt gefahren.
∃ (opponent) ∀ (goal)
∀ (goal) ∃ (opponent)
Michael ist gegen jeden Rivalen in mindestens eine Stadt gefahren.
∀ (opponent) ∃ (goal)
∃ (goal) ∀ (opponent)

Michael ist in jede Stadt gegen mindestens einen Rivalen gefahren.
∀ (goal) ∃ (opponent)
?? ∃ (opponent) ∀ (goal)

Result (QS)

(1,2,0,0,0,0) DPO2 > Malefactive

A.2.3.12.2 Pair-List Reading

In welche Stadt ist Michael gegen jeden Rivalen gefahren?

→ Gegen welchen Rivalen ist Michael in jede Stadt gefahren?

Result (PLR)

DPO2 > Malefactive

A.2.3.12.3 Informational Focus

Michael ist gegen Ralph nach München gefahren.
Michael is against Ralph to Munich driven
'Michael raced to Munich against Ralph.'

Wohin ist Michael gegen Ralph gefahren?
Er ist gegen Ralph nach München gefahren.
?? Er ist nach München gegen Ralph gefahren.

Gegen wen ist Michael nach München gefahren?
Er ist gegen Ralph nach München gefahren.
Er ist nach München gegen Ralph gefahren.

Result (IF)

(2,1) Malefactive > DPO2

A.2.3.13 DPO2 – Means

A.2.3.13.1 Quantifier Scope

Klaus ist in mindestens eine Hauptstadt Europas mit jedem Wagen gefahren.
Klaus is into at least one capital of Europe with every car driven
'Klaus travelled with every car into at least one capital of Europe.'

Klaus ist in mindestens eine Hauptstadt Europas mit jedem Wagen gefahren.
∃ (goal) ∀ (means)
?? ∀ (means) ∃ (goal)
Klaus ist mit mindestens einem Wagen in jede Hauptstadt Europas gefahren.  
∃ (means) ∀ (goal)  
∀ (goal) ∃ (means)  

Klaus ist mit jedem Wagen in mindestens eine Hauptstadt Europas gefahren.  
∀ (means) ∃ (goal)  
∃ (goal) ∀ (means)  

Klaus ist in jede Hauptstadt Europas mit mindestens einem Wagen gefahren.  
∀ (goal) ∃ (means)  
? ∃ (means) ∀ (goal)  

Result (QS)  
(1,1,0,0,1,0) DPO2 > Means  

A.2.3.13.2 Pair-List Reading  
In welche Stadt ist Klaus mit jedem Wagen gefahren?  
→ Mit welchem Wagen ist Klaus in jede Stadt gefahren?  

Result (PLR)  
DPO2 > Means  

A.2.3.13.3 Informational Focus  
Klaus ist mit der Ente nach Hamburg gefahren.  
Klaus is with the deuxchevaux to Hamburg driven  
Klaus travelled to Hamburg with the deuxchevaux.  

Mit welchem Wagen ist Klaus nach Hamburg gefahren?  
Klaus ist mit der Ente nach Hamburg gefahren.  
Klaus is with the deuxchevaux to Hamburg driven.  
Klaus travelled to Hamburg with the deuxchevaux.  

Wohin ist Klaus mit der Ente gefahren?  
Klaus ist mit der Ente nach Hamburg gefahren.  
? Klaus ist nach Hamburg mit der Ente gefahren.  

Result (IF)  
(1,0) Means > DPO2
A.2.3.14 DPO2 – Duration Temporal1

A.2.3.14.1 Pair-List Reading

Wie lange sind die Krügers in jedes Land gefahren?

Result (PLR)

Duration Temporal1 > DPO2

A.2.3.14.2 Informational Focus

Die Krügers sind für drei Stunden nach Afrika gefahren.  
The Krügers are for three hours to Africa driven 
'The Krüger family travelled to Africa for a three hours stay.'

(Für) Wie lange sind die Krügers nach Afrika gefahren? 
Die Krügers sind für drei Stunden nach Afrika gefahren. 
Die Krügers sind nach Afrika für drei Stunden gefahren.

Wohin sind die Krügers in drei Stunden gefahren? 
Die Krügers sind für drei Stunden nach Afrika gefahren. 
?? Die Krügers sind nach Afrika für drei Stunden gefahren.

Result (IF)

(2,0) Duration Temporal1 > DPO2

A.2.3.15 DPO2 – Duration Temporal2

A.2.3.15.1 Pair-List Reading

Wie lange sind die Krügers in jedes Land gefahren?

Result (PLR)

Duration Temporal1 > DPO2

A.2.3.15.2 Informational Focus

Die Krügers sind in drei Stunden nach Afrika gefahren.  
The Krügers are in three hours to Afrika driven 
'The Krüger family travelled to Afrika in three hours.'

Wie lange sind die Krügers nach Afrika gefahren? 
Die Krügers sind in drei Stunden nach Afrika gefahren. 
Die Krügers sind nach Afrika in drei Stunden gefahren.

Wohin sind die Krügers in drei Stunden gefahren? 
Die Krügers sind in drei Stunden nach Afrika gefahren. 
?? Die Krügers sind nach Afrika in drei Stunden gefahren.
A.2.4 Reason Prepositional Object (folgen aus)

The use of the perfect with "folgen aus" (to follow from), i.e. a sentence like "Der Satz ist aus der Annahme gefolgt" as opposed to the imperfect "Der Satz folgte aus der Annahme" is more than odd for reasons yet to be understood.

A.2.4.1 RPO – Temporal

A.2.4.1.1 Quantifier Scope

After Albert arrived in Wonderland nothing seemed to be the same as before. Even logic itself had changed. Conclusions that could be derived from a certain axiom on Wednesdays seem to be incompatible with them on Thursdays. Maybe he shouldn't have eaten that mushroom! But given his rational character the next thing to do was making a list of different axioms and conclusions and looking when which conclusion could be derived from which axiom.

Die Relativitätstheorie folgte an mindestens einem Tag aus jedem Axiom.
The Theory of Relativity followed on at least one day from every axiom.
'The Theory of Relativity followed from every axiom on at least one day.'

Die Relativitätstheorie folgte an mindestens einem Tag aus jedem Axiom.
∃ (time) ∀ (RPO)

Die Relativitätstheorie folgte aus mindestens einem Axiom an jedem Tag.
∃ (RPO) ∀ (time)
∀ (time) ∃ (RPO)

Die Relativitätstheorie folgte aus jedem Axiom an mindestens einem Tag.
∀ (RPO) ∃ (time)
∃ (time) ∀ (RPO)

Die Relativitätstheorie folgte an jedem Tag aus mindestens einem Axiom.
∀ (time) ∃ (RPO)
∃ (RPO) ∀ (time)

Result (QS)

(1,2,0,0,0,0) Temporal > RPO

A.2.4.1.2 Pair-List Reading

An welchem Tag folgte die Relativitätstheorie aus jedem Axiom?

→ Aus welchem Axiom folgte die Relativitätstheorie an jedem Tag?
Die Relativitätstheorie folgte am Montag aus der Konstanz der Lichtgeschwindigkeit.
The Theory of Relativity followed on Monday from the constancy of the speed of light 'The Theory of Relativity followed from the constancy of the speed of light on Monday.'


Aus was folgt die Relativitätstheorie am Montag? Die Relativitätstheorie folgte am Montag aus der Konstanz der Lichtgeschwindigkeit. * Die Relativitätstheorie folgte aus der Konstanz der Lichtgeschwindigkeit am Montag.

Die Relativitätstheorie folgt für mindestens einen Physiker aus jedem Axiom.
The Theory of Relativity follows for at least one physicist from every axiom 'For at least one physicist, the Theory of Relativity followed from every axiom.'

Die Relativitätstheorie folgt für mindestens einen Physiker aus jedem Axiom.
∃ (benefactive) ∀ (RPO)

Die Relativitätstheorie folgt aus mindestens einem Axiom für jeden Physiker.
∃ (RPO) ∀ (benefactive)
∀ (benefactive) ∃ (RPO)

Die Relativitätstheorie folgt aus jedem Axiom für mindestens einen Physiker.
∀ (RPO) ∃ (benefactive)
∃ (benefactive) ∀ (RPO)

Die Relativitätstheorie folgt für jeden Physiker aus mindestens einem Axiom.
∀ (benefactive) ∃ (RPO)
?? ∃ (RPO) ∀ (benefactive)
A.2.4.2.2 Pair-List Reading

Für wen folgte die Relativitätstheorie aus jedem Axiom?

→ Aus welchem Axiom folgt die Relativitätstheorie für jeden Physiker?

A.2.4.2.3 Informational Focus

Die Relativitätstheorie folgt für Albert aus der Konstanz der Lichtgeschwindigkeit.

'Die Relativitätstheorie folgt für Albert aus der Konstanz der Lichtgeschwindigkeit.'

Für wen folgt die Relativitätstheorie aus der Konstanz der Lichtgeschwindigkeit?

Die Relativitätstheorie folgt für Albert aus der Konstanz der Lichtgeschwindigkeit.

Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit für Albert.

Aus was folgt für Albert die Relativitätstheorie?

Die Relativitätstheorie folgt für Albert aus der Konstanz der Lichtgeschwindigkeit.

* Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit für Albert.

A.2.4.3 RPO – Reason

Now we can see, whether the RPOs are really reason arguments. They are compatible with another reason adjunct, remains the question, whether we have to distinguish between different types of reason adjuncts or whether the RPO is more something like a source or whether it is something new.

A.2.4.3.1 Quantifier Scope

Die Relativitätstheorie folgt wegen mindestens einem Prinzip aus jedem Axiom.

'The Theory of Relativity follows because of at least one principle from every axiom.'

Die Relativitätstheorie folgt wegen mindestens einem Prinzip aus jedem Axiom.

∃ (reason) ∀ (RPO)

∀ (RPO) ∃ (reason)
Die Relativitätstheorie folgt aus mindestens einem Axiom wegen jedem Prinzip.

\exists (\text{RPO}) \forall (\text{reason})

? \forall (\text{reason}) \exists (\text{RPO})

Die Relativitätstheorie folgt aus jedem Axiom wegen mindestens einem Prinzip.

\forall (\text{RPO}) \exists (\text{reason})

\exists (\text{reason}) \forall (\text{RPO})

Die Relativitätstheorie folgt wegen jedem Prinzip aus mindestens einem Axiom.

\forall (\text{reason}) \exists (\text{RPO})

\exists (\text{RPO}) \forall (\text{reason})

Result (QS)

(1,0,0,0,0) \text{ RPO > Reason}

A.2.4.3.2 Pair-List Reading

→ Woraus folgt die Relativitätstheorie wegen jedem Prinzip?

Wegen welchem Prinzip folgt die Relativitätstheorie aus jedem Axiom?

Result (PLR)

\text{Reason > RPO}

A.2.4.3.3 Informational Focus

Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit wegen dem Symmetrieprinzip.

'The Theory of Relativity follows because of the Principle of Symmetry from the constancy of the speed of light.'

Wegen welchem Prinzip folgt die Relativitätstheorie aus der Konstanz der Lichtgeschwindigkeit?

Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit wegen dem Symmetrieprinzip.

Die Relativitätstheorie folgt wegen dem Symmetrieprinzip aus der Konstanz der Lichtgeschwindigkeit.

Woraus folgt die Relativitätstheorie wegen dem Symmetrieprinzip?

?? Die Relativitätstheorie folgt aus der Konstanz der Lichtgeschwindigkeit wegen dem Symmetrieprinzip.

Die Relativitätstheorie folgt wegen dem Symmetrieprinzip aus der Konstanz der Lichtgeschwindigkeit.

Result (IF)

(2,0) \text{ Reason > RPO}
A.2.4.4 RPO – Locative

A.2.4.4.1 Quantifier Scope
Wonderland was more miraculous than Albert ever had thought. After a little walk he arrived at a huge field of gigantic mushrooms. A caterpillar invited him to sit on his back and together they climbed up the stem of some kind of champignon. On its top, Albert could see hundreds of these mushrooms. In the far he saw a huge castle which seemed to be made of playing cards. It seemed possible to get to it by jumping from mushroom to mushroom. And so he did! Being a scientist by heart, Albert tried to figure out, whether the drawing of conclusion from certain axioms would vary with the mushroom he was standing on. And in fact he was right!

Die Relativitätstheorie folgte auf mindestens einem Pilz aus jedem Axiom.
The Theory of Relativity followed on at least one mushroom from every axiom 'The Theory of Relativity followed from every axiom on at least one mushroom.'

Die Relativitätstheorie folgte auf mindestens einem Pilz aus jedem Axiom.
∃ (place) ∀ (RPO)

∀ (RPO) ∃ (place)

Die Relativitätstheorie folgte aus mindestens einem Axiom auf jedem Pilz.
∃ (RPO) ∀ (place)

∀ (place) ∃ (RPO)

Die Relativitätstheorie folgte aus jedem Axiom auf mindestens einem Pilz.
∀ (RPO) ∃ (place)

∃ (place) ∀ (RPO)

Die Relativitätstheorie folgte auf jedem Pilz aus mindestens einem Axiom.
∀ (place) ∃ (RPO)

∃ (RPO) ∀ (place)

Result (QS)

(3,3,0,0,0,1) Locative > RPO

A.2.4.4.2 Pair-List Reading

→ Aus welchem Axiom folgte die Relativitätstheorie auf jedem Pilz?

Auf welchem Pilz folgte die Relativitätstheorie aus jedem Axiom?

Result (PLR)

Locative > RPO

A.2.4.4.3 Informational Focus

Die Relativitätstheorie folgte auf dem gelben Pilz aus der Mehrwerttheorie.
The Theory of Relativity followed on the yellow mushroom from the Theory of Mehrwert 'On the yellow mushroom, the Theory of Relativity followed from the Theory of Mehrwert.'
Woraus folgte die Relativitätstheorie auf dem gelben Pilz?
Die Relativitätstheorie folgte auf dem gelben Pilz aus der Mehrwerttheorie.
* Die Relativitätstheorie folgte aus der Mehrwerttheorie auf dem gelben Pilz.

Wo folgte die Relativitätstheorie aus der Mehrwerttheorie?
Die Relativitätstheorie folgte auf dem gelben Pilz aus der Mehrwerttheorie.
Die Relativitätstheorie folgte aus der Mehrwerttheorie auf dem gelben Pilz.

Result (IF)

(3,1)  Locative > RPO

A.2.4.5 RPO – Instrumental

A.2.4.5.1 Quantifier Scope
Albert's favourite tools for deducing conclusions where Modus Tolens, Modus Ponens and Syllogism.

Die Relativitätstheorie folgte mit mindestens einer Regel aus jedem Axiom.
The Theory of Relativity followed with at least one rule from every axiom.
'The Theory of Relativity followed from every axiom with at least one rule.'

Die Relativitätstheorie folgte mit mindestens einer Regel aus jedem Axiom.
∃ (instrument) ∀ (RPO)
∀ (RPO) ∃ (instrument)

Die Relativitätstheorie folgte aus mindestens einem Axiom mit jeder Regel.
∃ (RPO) ∀ (instrument)
?? ∀ (instrument) ∃ (RPO)

Die Relativitätstheorie folgte aus jedem Axiom mit mindestens einer Regel.
∀ (RPO) ∃ (instrument)
?? ∃ (instrument) ∀ (RPO)

Die Relativitätstheorie folgte mit jeder Regel aus mindestens einem Axiom.
∀ (instrument) ∃ (RPO)
∃ (RPO) ∀ (instrument)

Result (QS)

(2,2,0,0,0,0)  RPO > Instrumental

A.2.4.5.2 Pair-List Reading
→ Mit welcher Regel folgte die Relativitätstheorie aus jedem Axiom?
Aus welchem Axiom folgte die Relativitätstheorie mit jeder Regel?

Result (PLR)

RPO > Instrumental
A.2.4.5.3 Informational Focus

'Die Relativitätstheorie folgte mittels Syllogismus aus der Konstanz der Lichtgeschwindigkeit.
'The Theory of Relativity followed from the constancy of speed of light by means of syllogism.'

Womit folgte die Relativitätstheorie aus der Konstanz der Lichtgeschwindigkeit?
Die Relativitätstheorie folgte aus der Konstanz der Lichtgeschwindigkeit mittels Syllogismus.
Die Relativitätstheorie folgte mittels Syllogismus aus der Konstanz der Lichtgeschwindigkeit.

Woraus folgte die Relativitätstheorie mittels Syllogismus?
* Die Relativitätstheorie folgte aus der Konstanz der Lichtgeschwindigkeit mittels Syllogismus.
Die Relativitätstheorie folgte mittels Syllogismus aus der Konstanz der Lichtgeschwindigkeit.

Result (IF)

(3,0) Instrumental > RPO

A.2.4.6 RPO – Manner

A.2.4.6.1 Quantifier Scope

Albert was a real genius. He was not only able to draw conclusion in a logical but also in an intuitive way. He took an axiom, meditated over it and almost magically saw all the possible conclusions that could be drawn from it.

Die Relativitätstheorie folgte auf mindestens eine Art aus jedem Axiom.
The Theory of Relativity followed in at least one way from every axiom
'The Theory of Relativity followed from every axiom in at least one way'

Die Relativitätstheorie folgte auf mindestens eine Art aus jedem Axiom.
∃ (manner) ∀ (RPO)
∀ (RPO) ∃ (manner)

Die Relativitätstheorie folgte aus mindestens einem Axiom auf jede Art.
∃ (RPO) ∀ (manner)
?? ∀ (manner) ∃ (RPO)

Die Relativitätstheorie folgte aus jedem Axiom auf mindestens eine Art.
∀ (RPO) ∃ (manner)
? ∃ (manner) ∀ (RPO)

Die Relativitätstheorie folgte auf jede Art aus mindestens einem Axiom.
∀ (manner) ∃ (RPO)
∃ (RPO) ∀ (manner)
A.2.4.6.2 Pair-List Reading

→ Auf welche Art folgte das Zwillingsparadoxon aus jedem Axiom?

Woraus folgte das Zwillingsparadoxon auf jede Art?

A.2.4.6.3 Informational Focus

Das Zwillingsparadoxon folgte auf intuitive Art aus der Relativitätstheorie.
The Paradox of Twins followed in a intuitive way from the Theory of Relativity
'The Paradox of Twins followed from the Theory of Relativity in an intuitive way.'

Auf welche Art folgte das Zwillingsparadoxon aus der Relativitätstheorie?
Das Zwillingsparadoxon folgte auf intuitive Art aus der Relativitätstheorie.
Das Zwillingsparadoxon folgte aus der Relativitätstheorie auf intuitive Art.

Woraus folgte das Zwillingsparadoxon auf intuitive Art?
Das Zwillingsparadoxon folgte auf intuitive Art aus der Relativitätstheorie.
Das Zwillingsparadoxon folgte aus der Relativitätstheorie auf intuitive Art.

A.2.4.7 RPO – Comitative

In the following examples we don't have really Comitative modifiers of the principal state of affairs.
Furthermore there is no distributive reading available. The conclusion can only be seen as a
collective ensemble together with the "mit"-PP. No judgements can be made.

A.2.4.7.1 Quantifier Scope

Das Zwillingsparadoxon folgt mit mindestens einem Kontraktionssatz aus jedem Axiom.
The Paradox of Twins follows with at least one sentence of contraction from every axiom
'The Paradox of Twins follows from every axiom with at least one sentence of contraction.'

Das Zwillingsparadoxon folgt mit mindestens einem Kontraktionssatz aus jedem Axiom.
∃ (comitative) ∀ (RPO)
∀ (RPO) ∃ (comitative)

Das Zwillingsparadoxon folgt aus mindestens einem Axiom mit jedem Kontraktionssatz.
∃ (RPO) ∀ (comitative)
∀ (comitative) ∃ (RPO)
Das Zwillingsparadoxon folgt aus jedem Axiom mit mindestens einem Kontraktionssatz.
∀ (RPO) ∃ (comitative)
∃ (comitative) ∀ (RPO)

Das Zwillingsparadoxon folgt mit jedem Kontraktionssatz aus mindestens einem Axiom.
∀ (comitative) ∃ (RPO)
∃ (RPO) ∀ (comitative)

Result (QS)

A.2.4.8 RPO – Evidential

A.2.4.8.1 Quantifier Scope

Die Relativitätstheorie folgt gemäß mindestens einem Physiker aus jedem Axiom.
The Theory of Relativity follows according to at least one physicist from every axiom
'According to at least one physicist, the Theory of Relativity follows from every axiom.'

Die Relativitätstheorie folgt gemäß mindestens einem Physiker aus jedem Axiom.
∃ (RPO) ∀ (witness)
* ∀ (RPO) ∃ (witness)

Die Relativitätstheorie folgt aus mindestens einem Axiom gemäß jedem Physiker.
∃ (RPO) ∀ (witness)
∀ (witness) ∃ (RPO)

Die Relativitätstheorie folgt aus jedem Axiom gemäß mindestens einem Physiker.
∀ (RPO) ∃ (witness)
∃ (witness) ∀ (RPO)

Die Relativitätstheorie folgt gemäß jedem Physiker aus mindestens einem Axiom.
∀ (witness) ∃ (RPO)
? ∃ (RPO) ∀ (witness)

Result (QS)

(3,1,0,0,1,1) Evidential > RPO

A.2.4.8.2 Pair-List Reading

Gemäß wem folgt die Relativitätstheorie aus jedem Axiom?

Aus welchem Axiom folgt die Relativitätstheorie gemäß jedem Physiker?

Result (PLR)

Evidential > RPO
A.2.4.8.3 Informational Focus

Das Zwillingsparadoxon folgt gemäß George aus der Relativitätstheorie.
The Paradox of Twins follows according to George from the Theory of Relativity
'According to George, the Paradox of Twins follows from the Theory of Relativity.'

Gemäß wem folgt das Zwillingsparadoxon aus der Relativitätstheorie?
Das Zwillingsparadoxon folgt gemäß George aus der Relativitätstheorie.
Das Zwillingsparadoxon folgt aus der Relativitätstheorie gemäß George.

Woraus folgt das Zwillingsparadoxon gemäß George?
Das Zwillingsparadoxon folgt gemäß George aus der Relativitätstheorie.
* Das Zwillingsparadoxon folgt aus der Relativitätstheorie gemäß George.

Result (IF)

(3,1) Evidential > RPO
B Appendix B References To Events

B.1 Benefactive – Temporal

Hans hat am Freitag für Herrn Müller ein Vogelhaus gebaut...
Hans has on Friday for Mr. Müller a birdhouse constructed.
'Hans constructed a birdhouse for Mr. Müller on Friday.'

Hans hat am Freitag für Herrn Müller ein Vogelhaus gebaut, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to construct a birdhouse" or "to construct a birdhouse for Mr. Miller" or "to construct a birdcage for Mr. Miller on Friday"
* = "to construct a birdcage on Friday"

Hans hat für Herrn Müller am Freitag ein Vogelhaus gebaut, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to construct a birdcage" or "to construct a birdcage on Friday" or "to construct a birdcage on Friday for Mr. Miller" or "to construct a birdcage for Mr. Miller"

Result (RE)

Temporal > Benefactive

B.2 Reason – Temporal

Hans hat am Samstag wegen einer Klassenarbeit die Schule geschwänzt.
Hans has on Saturday because of a class test the school skipped
'Hans skived off school because of a class test on Saturday.'

Hans hat am Samstag wegen einer Klassenarbeit die Schule geschwänzt, (etwas,) womit niemand gerechnet hatte.

etwas = "to be absent from school" or "to be absent from school because of a class test" or "to be absent from school because of a class test on saturday"
? = "to be absent from school on saturday"

Hans hat wegen einer Klassenarbeit am Samstag die Schule geschwänzt, (etwas,) womit niemand gerechnet hatte.

etwas = "to be absent from school" or "to be absent from school because of a class test" or "to be absent from school because of a class test on saturday" or "to be absent from school on saturday"

Result (RE)

Temporal > Reason
B.3 Reason – Benefactive

Hans hat wegen eines Diebstahls für Herrn Maier Büchsen gestapelt.
'Hans stacked cans for Mr. Maier because of a theft.'

Hans hat wegen eines Diebstahls für Herrn Maier Büchsen gestapelt, etwas was er vorher noch nie gemacht hatte.

etwas = "to staple cans" or "to staple cans for Mr. Maier" or "to staple cans for Mr. Maier because of a theft" or "to staple cans for Mr. Maier because of a theft"

Hans hat für Herrn Maier wegen eines Diebstahls Büchsen gestapelt, etwas was er vorher noch nie gemacht hatte.

etwas = "to staple cans" or "to staple cans for Mr. Maier because of a theft" or "to staple cans for Mr. Maier because of a theft"

Result (RE)

Benefactive > Reason

B.4 Locative – Temporal

Hans hat am Freitag in Venedig eine Gondel gezeichnet.
'Hans painted a gondola in Venice on Friday.'

Hans hat am Freitag in Venedig eine Gondel gezeichnet, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to paint a gondola" or "to paint a gondola in Venice" or "to paint a gondola in Venice on a Friday"

* = "to paint a gondola on a Friday"

Hans hat in Venedig am Freitag eine Gondel gezeichnet, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to paint a gondola" or "to paint a gondola in Venice" or "to paint a gondola in Venice on a Friday" or "to paint a gondola on a Friday"

B.4.1 Result (RE)

Temporal > Locative
B.5 Locative – Benefactive

Hans hat in Venedig für Herrn Maier eine Gondel gezeichnet.
Hans has in Venice for Mr. Maier a gondola painted.
'Hans painted a gondola for Mr. Maier in Venice.'

Hans hat in Venedig für Herrn Maier eine Gondel gezeichnet, etwas was er vorher noch nie gemacht hatte.

etwas = "to paint a gondola" or " to paint a gondola for Mr. Maier" or " to paint a gondola for Mr. Maier in Venice" or " to paint a gondola in Venice"

Hans hat für Herrn Maier in Venedig eine Gondel gezeichnet, etwas was er vorher noch nie gemacht hatte.

etwas = "to paint a gondola" or " to paint a gondola in Venice" or " to paint a gondola in Venice for Mr. Maier"
* = " to paint a gondola for Mr. Maier"

Result (RE)

Benefactive > Locative

B.6 Instrumental – Temporal

Hans hat am Freitag mit Wasserfarben eine Gondel gezeichnet.
Hans has on Friday with watercolours a gondola drawn.
'Hans drew a gondola with watercolours on Friday.'

Hans hat am Freitag mit Wasserfarben eine Gondel gezeichnet, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to paint a gondola" or "to paint a gondola with water colours" or "to paint a gondola with water colours on Friday"
* = "to paint a gondola on Friday"

Hans hat mit Wasserfarben am Freitag eine Gondel gezeichnet, etwas was er sich vorher nicht zugetraut hätte.

etwas = "to paint a gondola" or "to paint a gondola in Venice" or "to paint a gondola in Venice on Friday" or "to paint a gondola on Friday"

Result (RE)

Temporal > Instrumental
B.7 Instrumental – Benefactive

Hans hat für Herrn Maier mit einem Schraubenzieher ein Radio repariert
Hans hat für Herrn Maier mit einem Schraubenzieher ein Radio repariert, etwas was er vorher noch nie gemacht hatte.

etwas = "to repair a radio" or "to repair a radio with a screwdriver" or "to repair a radio with a screwdriver for Mr. Maier" or
* = "to repair a radio for Mr. Maier"

Result (RE)

Benefactive > Instrumental

B.8 Instrumental – Locative

Van Gogh hat in Arles mit Tusche ein Café gemalt.
Van Gogh hat in Arles mit Tusche ein Café gemalt, etwas was er vorher noch nie gemacht hatte.

etwas = "to paint a coffeehouse" or "to paint a coffeehouse with Indian ink" or "to paint a coffeehouse with Indian ink in Arles"
* = "to paint a coffeehouse in Arles"

Result (RE)

Locative > Instrumental
B.9 Duration Temporal1 – Temporal

Hans ist im Jahre 2000 für drei Monate weggefahren.
Hans is in the year 2000 for three months away
'Hans went away (left home) for three months in the year 2000.'

Hans ist im Jahre 2000 für drei Monate weggefahren, etwas was er sich vorher nicht
zugetraut hätte.

etwas = "go away" or "go away for three months in 2000" or "go away for three months"
* "go away in 2000"

Hans ist für drei Monate im Jahre 2000 weggefahren, etwas was er sich vorher nicht
zugetraut hätte.

etwas = "go away" or "go away for three months in 2000" or "go away for three months" or "go
away in 2000"

Result (RE)

Temporal > DurationTemporal1

B.10 Duration Temporal1 – Benefactive

Familie Krüger ist für den Polyglott-Verlag für drei Monate in Urlaub gefahren.
Family Krüger is for the Polyglott publishing house for three months in vacation driven
'The Krüger family went for a three months vacation for the Polyglott publishing house.'

Familie Krüger ist für den Polyglott-Verlag für drei Monate in Urlaub gefahren, etwas, was
ich nie für möglich gehalten habe.

etwas = "to go in vacation" or "to go for a three months vacation" or "to go for a three months
vacation for the Polyglott publishing house" or "to go for vacation for the Polyglott
publishing house"

Familie Krüger ist für drei Monate für den Polyglott-Verlag in Urlaub gefahren, etwas, was
ich nie für möglich gehalten habe.

etwas = "to go in vacation" or "to go for vacation for the Polyglott publishing house" or "to go for a
three months vacation for the Polyglott publishing house"
* "to go for a three months vacation"

Result

Duration Temporal1 > Benefactive

B.11 Duration Temporal2 – Goal

Barbara hat in 10 min nach New York geschrieben.
Barbara hat in 10 min nach New York geschrieben, etwas, was sie vorher noch nie gemacht hat.

etwas = "to write (a letter)" or "to write to New York" or "to write to New York in 10 min"

Barbara hat nach New York in 10 min geschrieben, etwas, was sie vorher noch nie gemacht hat.

etwas = "to write (a letter)" or "to write to New York" or "to write to New York in 10 min"
or "to write in 10 min to New York"

B.11.1 Result (RE)

Duration Temporal2 > Goal

B.12 Duration Temporal2 – Duration Temporal1

Er ist in drei Stunden für zwei Wochen nach Teneriffa geflogen.
He is in three hours for two weeks to Tenerife flown
'He flew to Tenerife in three hours, in order to stay there two weeks.'

Er ist in drei Stunden für zwei Wochen nach Teneriffa geflogen, etwas, was er vorher noch nie gemacht hat.

etwas = "to fly to Tenerife" or "to fly to Tenerife to stay there two weeks" or "to fly to Tenerife in three hours to stay there two weeks"
* "to fly to Tenerife for three hours"

Er ist für zwei Wochen in drei Stunden nach Teneriffa geflogen, etwas, was er vorher noch nie gemacht hat.

etwas = "to fly to Tenerife" or "to fly to Tenerife in three hours" or "to fly to Tenerife in three hours to stay there two weeks"
? "to fly to Tenerife to stay there two weeks"

B.12.1 Result
Though nor very sharp in difference

Duration Temporal2 > Duration Temporal1

B.13 Duration Temporal3 – Malefactive

Michael ist vier Stunden lang gegen Mercedes gefahren.
Michael is four hours long against Mercedes driven
'Michael drove for four hours against Mercedes.'
Michael ist vier Stunden lang gegen Mercedes gefahren, etwas was er sich vorher nicht zugetraut hätte.

**etwas**

= "drive" or "drive for four hours against Mercedes" or "drive against Mercedes"

* "drive for four hours"

Michael ist gegen Mercedes vier Stunden lang gefahren, etwas was er sich vorher nicht zugetraut hätte.

**etwas**

= "drive" or "drive against Mercedes" or "drive for four hours against Mercedes" or "drive for four hours"

**Result (RE)**

**Duration Temporal 3 > Malefactive**

**B.14 Duration Temporal 3 - Locative**

Krügers haben in Mainz drei Wochen lang gefeiert.

Krügers have in Mainz three weeks long celebrated

The Krüger family celebrated for three weeks in Mainz.

Krügers haben in Mainz drei Wochen lang gefeiert, etwas, was sie vorher noch nie gemacht haben.

**etwas**

= "to celebrate" or "to celebrate three weeks" or "to celebrate three weeks in Mainz" or "to celebrate in Mainz"

Krügers haben drei Wochen lang in Mainz gefeiert, etwas, was sie vorher noch nie gemacht haben.

**etwas**

= "to celebrate" or "to celebrate in Mainz" or "to celebrate in Mainz for three weeks" or "to celebrate for three weeks"

**Result (RE)**

**Duration Temporal 3 > Locative**

**B.15 Source Temporal 2 – Locative**

Vincent malt in Italien seit November.

Vincent paints in Italy since November

Vincent is painting since November in Italy.

Vincent malt in Italien seit November, etwas, was er sich schon immer gewünscht hat.

**etwas**

= "to paint" or "to paint in Italy" or "to paint since November in Italy"

? "to paint since November"

Vincent malt seit November in Italien, etwas, was er sich schon immer gewünscht hat.
etwas
= "to paint" or "to paint in Italy" or "to paint in Italy since November"
* "to paint since November"

B.15.1 Result (RE)

Source Temporal2 > Locative

B.16 LPO – Manner

Claudia hat in einem Badeanzug auf einer Liege gelegen.
Claudia has in a bathing suit on a sun layer lain
'Claudia lay on a sun layer in a bathing suit.'

Claudia hat in einem Badeanzug auf einer Liege gelegen, etwas, was sie vorher noch nie gemacht hat.
etwas
= "to lie on a sun layer" or "to lie on a sun layer in a bathing suit"
* "to lie" or "to lie in a bathing suit"

Claudia hat auf einer Liege in einem Badeanzug gelegen, etwas, was sie vorher noch nie gemacht hat.
etwas
= "to lie in a bathing suit on a sun layer" or "to lie in a bathing suit"
* "to lie" or "to lie on a sun layer"

B.16.1 Result (RE)

?

B.17 DPO-Benefactive

Der Student hat die Kreide für Prof. Wuselig auf das Pult gelegt.
The student has the chalk for Prof. Wuselig on the desk placed
'The student placed the chalk on the desk for Prof. Wuselig.'

Der Student hat die Kreide für Prof. Wuselig auf das Pult gelegt, etwas, was er vorher noch nie gemacht hatte.
etwas
= "to place the chalk on the desk" or "to place the chalk on the desk for Prof. Wuselig"
* "to place the chalk" or "to place the chalk for Prof. Wuselig"

Der Student hat die Kreide auf das Pult für Prof. Wuselig gelegt, etwas, was er vorher noch nie gemacht hatte.
etwas
= "to place the chalk on the desk for Prof. Wuselig"
* "to place the chalk" or "to place the chalk for Prof. Wuselig"
? "to place the chalk on the desk"
B.18DPO – Instrumental

Er hat die Kartoffeln mit einer Gabel auf einen Teller gelegt.  
He has the potatoes with a fork on a plate placed  
'He placed the potatoes on a plate with a fork.'

Er hat die Kartoffeln mit einer Gabel auf einen Teller gelegt, etwas, was er vorher noch nie gemacht hat.

etwas  
= "to place the potatoes on a plate" or "to place the potatoes on a plate with a fork"  
* "to place the potatoes with a fork"

Er hat die Kartoffeln auf einen Teller mit einer Gabel gelegt, etwas, was er vorher noch nie gemacht hat.

etwas  
= "to place the potatoes on a plate with a fork" or "to place the potatoes on a plate"  
? "to place the potatoes with a fork"

B.19RPO – Instrumental

Die Relativitätstheorie folgte mittels Syllogismus aus der Konstanz der Lichtgeschwindigkeit.  
'The Theory of Relativity followed from the constancy of speed of light by means of syllogism.'

Die Relativitätstheorie folgte mittels Syllogismus aus der Konstanz der Lichtgeschwindigkeit, etwas, was Albert vorher nicht vermutet hatte.

etwas  
= "The Theorie of Relativity followed from the constancy of speed of light" or "The Theorie of Relativity followed from the constancy of speed of light by means of syllogism"  
* "The Theorie of Relativity followed by means of syllogism"

Die Relativitätstheorie folgte aus der Konstanz der Lichtgeschwindigkeit mittels Syllogismus, etwas, was Albert vorher nicht vermutet hatte.

etwas  
= "The Theorie of Relativity followed from the constancy of speed of light" or "The Theorie of Relativity followed from the constancy of speed of light by means of syllogism"  
?? "The Theorie of Relativity followed by means of syllogism"
Appendix C – Unmarked Word Order Data from English

An arrow indicates that the word order is seen as being unmarked. Bold face is marks the preferred word order.

C.1.1.1 Benefactive – Temporal

→ Hans worked for Mr. Miller on Friday.
→ Hans worked on Friday for Mr. Miller.

C.1.1.2 Reason – Temporal

→ Hans left school on Saturday because of stress.
   Hans left school because of stress on Saturday.

C.1.1.3 Reason – Benefactive

Hans worked for Mr. Maier because of his crime.
→ Hans worked because of his crime for Mr. Maier.

C.1.1.4

C.1.1.5 Locative – Temporal

→ Hans slept in Munich on Sunday.
→ Hans slept on Sunday in Munich.

C.1.1.6 Locative – Benefactive

→ Hans worked for Mrs. Schmidt in Berlin.
→ Hans worked in Berlin for Mrs. Schmidt.

C.1.1.7 Locative – Reason

→ Walter studied linguistics in Venice because of his interest in languages.
   Walter studied linguistics because of his interest in languages in Venice.

C.1.1.8

C.1.1.9 Instrumental – Temporal

→ Hans repaired the radio with the screwdriver on Friday.
   Hans repaired the radio on Friday with the screwdriver.

C.1.1.10 Instrumental – Benefactive

→ Hans repaired the radio with a screwdriver for Mr. Mayer.
   Hans repaired the radio for Mr. Mayer with a screwdriver.
C.1.1.11 Instrumental – Reason

→ The dentist worked with a drill because of a cavity.
   The dentist worked because of a cavity with a drill.

C.1.1.12
C.1.1.13 Instrumental – Locative

→ Van Gogh painted with Indian ink in Arles.
   → Van Gogh painted in Arles with Indian ink.

C.1.1.14 Manner – Temporal

→ Hans baked the cake with care on Friday.
   Hans baked the cake on Friday with care.

C.1.1.15 Manner – Benefactive

Hans baked the cake with care for Gabi.
→ Hans baked the cake for Gabi with care.

C.1.1.16 Manner – Reason

→ Rummenigge played with caution because of his injury.
   Rummenigge played because of his injury with caution.

C.1.1.17 Manner – Locative

→ Boris played in Wimbledon with caution.
   → Boris played with caution in Wimbledon.

C.1.1.18 Manner – Instrumental

→ Hans worked the wood with a knife in a careful manner.
   Hans worked the wood in a careful manner with a knife.

C.1.1.19 Comitative – Temporal

→ I worked on Tuesday with Hans.
→ I worked with Hans on Tuesday.

C.1.1.20 Comitative – Benefactive

→ He worked for "Proktor & son" with Hermann.
   → He worked with Hermann for "Proktor & son".

C.1.1.21 Comitative – Reason

Dr. Barnard worked hard because of an epidemic with Dr. Canard.
→ Dr. Barnard worked hard with Dr. Canard because of an epidemic.

C.1.1.22
C.1.1.23
C.1.1.24 Comitative – Locative

→ I worked in Butzbach with Franz.
→ I worked with Franz in Butzbach.

C.1.1.25 Comitative – Instrumental

I worked with Hans with a saw.
→ I worked with a saw with Hans.

C.1.1.26 Comitative - Manner

Hans cooked spaghetti with Elke in a careful manner.
→ Hans cooked spaghetti in a careful manner with Elke.

C.1.1.27 Evidential – Temporal

→ He worked on Thursday, according to Mrs. Schmidt.
He worked, according to Mrs. Schmidt, on Thursday. both with comma intonation

C.1.1.28 Evidential – Benefactive

Thomas wrote according to Mr. Maier for penguin books.
→ Thomas wrote for penguin books according to Mr. Maier.

C.1.1.29 Evidential – Reason

→ Hans cried according to Brigitte because of toothache.
→ Hans cried because of toothache according to Brigitte.

C.1.1.30 Evidential – Locative

→ He worked in Salzburg according to Mrs. Schmidt.
→ He worked according to Mrs. Schmidt in Salzburg.

C.1.1.31 Evidential – Instrumental

He shot according to Mr Schmidt with a gun.
→ He shot with a gun according to Mr Schmidt.

C.1.1.32 Evidential – Manner

→ He painted according to Barbara in a barbaric way.
→ He painted in a barbaric way according to Barbara.
C.1.1.33
C.1.1.34  Evidential – Comitative

→ Katrin worked according to Bruno with Schlöndorf (German director).
→ Katrin worked with Schlöndorf according to Bruno.

C.1.1.35  Matter - Temporal

→ Professor Müller spoke on Wednesday about the raising phenomena.
→ Professor Müller spoke about the raising phenomena on Wednesday.

C.1.1.36  Matter - Benefactive

→ Mr. Müller-Thurgau wrote about wine making for Penguin Books.
→ Mr. Müller-Thurgau wrote for Penguin books about wine making.

C.1.1.37  Matter - Reason

→ Hans talked because of his stay abroad about Italian language.
→ Hans talked about Italian language because of his stay abroad.

C.1.1.38  Matter - Locative

→ Mr. Müller-Lüdenscheidt talked in Moscow about new mafia methods.
→ Mr. Müller-Lüdenscheidt talked about new mafia methods in Moscow.

C.1.1.39  Matter - Instrumental

→ Hans wrote about Indonesian languages with his new pen.
→ Hans wrote with his new pen about Indonesian languages.

C.1.1.40  Matter - Manner

→ He talked about Thailanic in very serious manner.
→ He talked in very serious manner about Thailanic.

C.1.1.41  Matter - Comitative

→ Hans wrote with Brigitte about Hungarian.
→ Hans wrote about Hungarian with Brigitte.

C.1.1.42  Matter - Evidential

→ Herman spoke according to Mrs. Schmidt about cat hygiene.
→ Herman spoke about cat hygiene according to Mrs. Schmidt.
C.1.1.43
C.1.1.44 Benefactive – Temporal

* For Mr. Miller Hans worked on Friday.  
  → On Friday Hans worked for Mr. Miller.

C.1.1.45 Reason – Temporal

→ On Saturday Hans left school because of stress.  
? Because of stress Hans left school on Saturday.

C.1.1.46 Reason – Benefactive

* For Mr. Maier Hans worked because of his crime.  
  → Because of his crime Hans worked for Mr. Maier.

C.1.1.47
C.1.1.48 Locative – Temporal

* In Munich Hans slept on Sunday.  
  → On Sunday Hans slept in Munich.

C.1.1.49 Locative – Benefactive

* For Mrs. Schmidt Hans worked in Berlin.  
  → In Berlin Hans worked for Mrs. Schmidt.

C.1.1.50 Locative – Reason

In Venice Walter studied linguistics because of his interest in languages.  
→ Because of his interest in languages Walter studied linguistics in Venice.

C.1.1.51
C.1.1.52 Instrumental – Temporal

?? With the screwdriver Hans repaired the radio on Friday.  
  → On Friday Hans repaired the radio with the screwdriver.

C.1.1.53 Instrumental – Benefactive

→ With a screwdriver Hans repaired the radio for Mr. Mayer.  
+ For Mr. Mayer Hans repaired the radio with a screwdriver.

C.1.1.54 Instrumental – Reason

?? With a drill the dentist worked because of a cavity.  
  → Because of a cavity the dentist worked with a drill.
D Appendix D – QS data from English

D.1 Temporal – Instrumental

Vanessa played on at least one day with all her racquets.
∃ (time) ∀ (instrument)
∀ (instrument) ∃ (time)

Vanessa played with at least one racquet on every day of the week.
∀ (time) ∃ (instrument)
∃ (instrument) ∀ (time)

D.2 Temporal – Locative

Vanessa played on at least one day on all the tennis courts.
∃ (time) ∀ (place)
∀ (place) ∃ (time)

Vanessa played on at least one court every day.
∀ (time) ∃ (place)

D.3 Locative – Instrumental

Vanessa played with at least one racquet on all the courts.
∀ (place) ∃ (instrument)

Vanessa played on at least one court with all her racquets.
∃ (place) ∀ (instrument)
∀ (instrument) ∃ (place)

D.4 Locative – Reason

Vanessa played for at least one reason on all the courts.
∃ (reason) ∀ (place)
∀ (place) ∃ (reason)

Vanessa played on at least one court for all these reasons.
∃ (place) ∀ (reason)
∀ (reason) ∃ (place)

D.5 Temporal – Reason

Vanessa played on at least one day for all these reasons.
∃ (time) ∀ (reason)
∀ (reason) ∃ (time)
Vanessa played for at least one reason every day.
\[ \forall \text{(time)} \exists \text{(reason)} \]

? \[ \exists \text{(reason)} \forall \text{(time)} \]

**D.6 Instrumental – Reason**

Vanessa played with at least one racquet for all these reasons.
\[ \forall \text{(reason)} \exists \text{(instrument)} \]

? \[ \exists \text{(instrument)} \forall \text{(reason)} \]

Vanessa played for at least one reason with all her racquets.
\[ \exists \text{(reason)} \forall \text{(instrument)} \]
\[ \forall \text{(instrument)} \exists \text{(reason)} \]
E Appendix E - Nachfeld-kombinationen

These examples are not meant to evaluate the relative positions in the hierarchy of two PPs. Here I wanted to see what the scope relations are between different PPs, both being in the Nachfeld, i.e. right to verb. Therefore the evaluation is a bit different. First I allways compare sentences with the same constituents (not as in the examples above pairs with having the same order of quantifiers). In bold face you find for each sentence the preferred interpretation.

One question mark gives you for each pair the

E.1 Temporal - Instrumental

Van Gogh hat Blumen gemalt an mindestens einem Tag mit jeder Farbe.
∃ (time) ∀ (instrument)
? ∀ (instrument) ∃ (time)

Van Gogh hat Blumen gemalt mit jeder Farbe an mindestens einem Tag.
?? ∀ (instrument) ∃ (time)
∃ (time) ∀ (instrument)

Van Gogh hat Blumen gemalt mit mindestens einer Farbe an jedem Tag.
?? ∃ (instrument) ∀ (time)
∀ (time) ∃ (instrument)

Van Gogh hat Blumen gemalt an jedem Tag mit mindestens einer Farbe.
∀ (time) ∃ (instrument)
? ∃ (instrument) ∀ (time)

E.2 Locative – Matter

Herr Lüdenscheidt hat Vorlesungen gehalten in mindestens einer Stadt über jede romanische Sprache.
∃ (place) ∀ (matter)
?? ∀ (matter) ∃ (place)

Herr Lüdenscheidt hat Vorlesungen gehalten über jede romanische Sprache in mindestens einer Stadt.
?? ∀ (matter) ∃ (place)
∃ (place) ∀ (matter)

Herr Lüdenscheidt hat Vorlesungen gehalten über mindestens eine romanische Sprache in jeder Stadt.
?? ∃ (matter) ∀ (place)
∀ (place) ∃ (matter)

Herr Lüdenscheidt hat Vorlesungen gehalten in jeder Stadt über mindestens eine romanische Sprache.
∀ (place) ∃ (matter)
? ∃ (matter) ∀ (place)
E.3 Manner – Locative

Boris hat Tennis gespielt in mindestens einer Stadt auf jede Weise.
\[\exists \text{(place)} \forall \text{(manner)}\]
\[? \forall \text{(manner)} \exists \text{(place)}\]

Boris hat Tennis gespielt auf jede Weise in mindestens einer Stadt.
\[? \forall \text{(manner)} \exists \text{(place)}\]
\[\exists \text{(place)} \forall \text{(manner)}\]

Boris hat Tennis gespielt auf mindestens eine Weise in jeder Stadt.
\[\exists \text{(manner)} \forall \text{(place)}\]
\[\forall \text{(place)} \exists \text{(manner)}\]

Boris hat Tennis gespielt in jeder Stadt auf mindestens eine Weise.
\[\forall \text{(place)} \exists \text{(manner)}\]
\[\exists \text{(manner)} \forall \text{(place)}\]

E.4 Comitative – Instrumental

Ich habe Autos repariert mit mindestens einem Kollegen mit jedem Schraubenschlüssel.
\[\exists \text{(Comitative)} \forall \text{(Instrumental)}\]
\[\forall \text{(Instrumental)} \exists \text{(Comitative)}\]

Ich habe Autos repariert mit jedem Schraubenschlüssel mit mindestens einem Kollegen.
\[\forall \text{(Instrumental)} \exists \text{(Comitative)}\]
\[\exists \text{(Comitative)} \forall \text{(Instrumental)}\]

Ich habe Autos repariert mit mindestens einem Schraubenschlüssel mit jedem Kollegen.
\[\exists \text{(Instrumental)} \forall \text{(Comitative)}\]
\[\forall \text{(Comitative)} \exists \text{(Instrumental)}\]

Ich habe Autos repariert mit jedem Kollegen mit mindestens einem Schraubenschlüssel.
\[\forall \text{(Comitative)} \exists \text{(Instrumental)}\]
\[\exists \text{(Instrumental)} \forall \text{(Comitative)}\]

E.5 Reason-Benefactive

Er hat gebetet für mindestens einen Bruder wegen jeder Sünde.
\[\exists \text{(beneficiary)} \forall \text{(reason)}\]
\[?? \forall \text{(reason)} \exists \text{(beneficiary)}\]

Er hat gebetet wegen jeder Sünde für mindestens einen Bruder.
\[?? \forall \text{(reason)} \exists \text{(beneficiary)}\]
\[\exists \text{(beneficiary)} \forall \text{(reason)}\]

Er hat gebetet wegen mindestens einer Sünde für jeden Bruder.
\[\ast \exists \text{(reason)} \forall \text{(beneficiary)}\]
\[\forall \text{(beneficiary)} \exists \text{(reason)}\]
Er hat gebetet für jeden Bruder wegen mindestens einer Sünde.
∀ (beneficiary) ∃ (reason)
?? ∃ (reason) ∀ (beneficiary)

E.6 Locative – Benefactive

Er hat gearbeitet in mindestens einer Stadt für jede Firma.
∃ (place) ∀ (beneficiary)
? ∀ (beneficiary) ∃ (place)

Er hat gearbeitet für jede Firma in mindestens einer Stadt.
? ∀ (beneficiary) ∃ (place)
∃ (place) ∀ (beneficiary)

Er hat gearbeitet für mindestens eine Firma in jeder Stadt.
∃ (beneficiary) ∀ (place)
∀ (place) ∃ (beneficiary)

Er hat gearbeitet in jeder Stadt für mindestens eine Firma.
∀ (place) ∃ (beneficiary)
∃ (beneficiary) ∀ (place)

E.7 Instrumental – Path

Thomas hat das Flugzeug geflogen mit mindestens einem Instrument über jede Route.
∃ (instrument) ∀ (path)
∀ (path) ∃ (instrument)

Thomas hat das Flugzeug geflogen über jede Route mit mindestens einem Instrument.
∀ (path) ∃ (instrument)
∃ (instrument) ∀ (path)

Thomas hat das Flugzeug geflogen über mindestens eine Route mit jedem Instrument.
∃ (path) ∀ (instrument)
∀ (instrument) ∃ (path)

Thomas hat das Flugzeug geflogen mit jedem Instrument über mindestens eine Route.
∀ (instrument) ∃ (path)
∃ (path) ∀ (instrument)
F Appendix F - Relative Distances
F.1.1.11 Means
QS-Test

IF-Test

F.1.1.12 Path
QS-Test

IF-Test