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**Mechanisms of Harmony and the
Ordering of word order: Consistencies
and Inconsistencies in language change
and acquisition**

by

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requirements for the degree of Doctor of Philosophy in
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Declarations

The modelling work in chapter 6 has been in the Proceedings of the 25th Annual Conference of the Cognitive Science Society. All the work reported in the thesis is my own work. The thesis has not been submitted for a degree at another university>

Abstract

The thesis is based on the learning of word-orders in a cross-linguistic and historic perspective. In linguistics, a certain harmony is expected in word order. X-bars of a language are supposed to be right-branched or left-branched. So, a language, which is right-branched has its head usually first, and a language, which is left-branched has its head usually last. In the generative framework, linguists argue that when a child encounters a structure where the head is to the right, she will assume that the whole language is constructed this way. Cognitive scientists like Christiansen argue that inconsistencies, that means a mixture of right- and left- branching are more difficult to learn because of recursive embeddings, and thus inconsistencies should simply die out or never come into existence in the first place. Greenberg established language universals after having considered forty languages. These universals would show consistencies in an X-bar branching, but Greenberg also cited exceptions and spoke of statistical universals. We are interested in these inconsistencies. If they are really more difficult to learn, why do they evolve in the first place and why are they often quite consistent in language evolution, i.e. they do not die out. Historical linguistics often argue that languages tend to develop from one consistent language via a transitional one and then develop again towards a consistent language. Inconsistent structures exist in most languages although there is a statistical trend towards consistencies. So, how do languages change and what makes persons learn at one stage a language differently and what are the mechanisms involved in learning that we can see as an end-result in language change. We will examine some of these phenomena, when we discuss language change in Romance, the introduction of postpositions in German, and the role of the infinite verb in German and in Old English. Experimental work has been done for the frontability of German particles, which is closely linked to the introduction of postpositions. We did an experiment in English language for the role of the infinite verb in verb-final languages such as German and replicated this experiment in French because of its richer verb morphology because this gives us a greater distinction between finite and infinite verbs. An SRN-simulation on the role of the infinite verb supports the experiments.

Chapter 1

INTRODUCTION

This thesis looks at some basic word order phenomena, and especially those phenomena that do not seem to fit in a basic theoretical framework in linguistics. So in essence we were looking at exceptions to consistent branching in the head-ordering.

So, why is this the case, and why is this important? Exceptions are a problem for a theory, especially when we have to investigate those for gaining greater insight in the topic we are looking at. According to Kuhn (1962), there are exceptions to the rules, in his terminology, anomalies in all paradigms. A paradigm, in Kuhn's view, is not simply the current theory, but the entire worldview in which it exists, and all of the implications which come with it. According to Kuhn (1962), there are anomalies for all paradigms that are brushed away as acceptable levels of error, or simply ignored and not dealt with. In normal science, as he calls it, the scientist acts as a puzzling solver. A lot of puzzles might be solved in the framework of the paradigm, but anomalies do occur and cumulate. When enough significant anomalies have accrued against a current paradigm, the scientific discipline is thrown into a state of *crisis*, according to Kuhn (1962). During this crisis, new ideas are tried. Eventually a *new* paradigm is formed, which is a scientific revolution or a paradigm shift in Kuhn's words. Kuhn (1962) observes that the new paradigm and the old one are incommensurable literally, lacking comparison, untranslatable. New theories were not simply extensions of old theories, but radically new worldviews. This incommensurability applies not just before and after a paradigm shift, but between conflicting paradigms. The notions of light, which in Newton's

mechanical physics consists of waves supported by the mean of an ether (so that the waves can travel) is incommensurable with the Einsteinian approach where light consists of particles without any support of an ether. Darwin's mechanisms of evolution are incommensurable with the mechanisms of evolution established by Lamarck.

Darwin postulates that mutations simply happen accidentally and are thus not acquired as Lamarck postulated it. If a mutation can establish depends according to Darwin if it is beneficial to survival and subsequently the number of offspring. Lamarck on the other side argued that function precedes form. the inheritance of acquired characteristics such as the giraffe's neck is inherited. He thought that giraffes evolved their long neck by one generation stretching a lot to reach the leaves, lengthening their necks this way, and then passing this on to their children, who then stretched some more. Continued stretching over the generations led to today's long-necked giraffes. Darwin, on the other hand, proposed that early giraffes had necks of different lengths, some longer and some shorter (*Variation*). Limited food supplies meant that not all giraffes could obtain enough food to survive (*Competition*). Giraffes with longer necks could survive better and reproduce, passing their long-necked trait to their offspring, while those with shorter necks more often died off before being able to reproduce (*Natural Selection*). Over the generations the *average* giraffe neck became longer due to this process. Darwin's theory with mutations occurring by hazard, and Lamarck's theory claiming that inherited characteristics are acquired are thus incommensurable.

Kuhn's point of view is quite different of Popper's. Popper's philosophy requires that a single reproducible, anomalous phenomenon be enough to result in the rejection of a theory (Popper 1959, 86-7). According to Popper the revolutionary overthrow of a theory is one that is logically required by an anomaly. In Kuhn's view, it is only the accumulation of particularly troublesome anomalies that poses a serious problem for the

existing paradigm. A particularly troublesome anomaly is one that undermines the practice of normal science. For example, an anomaly might reveal inadequacies in some commonly used piece of equipment, perhaps by casting doubt on the underlying theory. If much of normal science relies upon this piece of equipment, normal science will find it difficult to continue with confidence until this anomaly is addressed. This results then in a scientific revolution where the paradigm is revised, in order to permit the solution of the more serious anomalous puzzles that disturbed the preceding period of normal science.

The abandon of an established framework and the creation of a new framework, which is independent of the previous one are rare and not always necessary.

Exceptions thus have to be investigated and they must be explained by a theoretical framework if possible. If it is not yet possible, it must be considered that with the current means we are not able to investigate them, but that it might be possible in the future.

Now let us turn to the science of interest in this thesis, linguistics. Chomsky is clearly the central figure linguistics in the 20th century. Chomsky published in 1957 *Syntactic Structures*, which was the first milestone in generative linguistics. According to Newmeyer (1986), this must be seen as a 'revolution' in the Kuhnian paradigm. What was new about this approach was that he set out a detailed formal system that mimic the ability of English speakers to produce all and only grammatical sentences of English. He distinguished two basic kinds of rules: phrase structure rules, which tell us how words are put together to form phrases, and transformational rules, which explains the movements of constituents out of their normal position.

Chomsky and his followers were also aware of certain constraints in the language. One transformational rule is wh-fronting such as in a sentence such as 'What did you say?'. In normal statements, the direct object follows the verb. Here in an interrogative phrase, the pronoun went out of its normal position to be fronted. When we have a statement such as 'They kept the car in the garage', we can ask 'Which garage did they keep the car in?'. But consider the following statement 'They kept the car that was in the garage' where we cannot ask the following question '*Which garage did they keep the car that was in?'. Such a constraint is not special to English, but seems to be cross-linguistically true. Subjacency - bounding

Such constraints gain more and more of importance, and they turned out to be more important than the rules. In the following years, many construction-specific and language specific transformational rules are given up in favour of language universal constraints such as Move-alpha (Chomsky 1981, 1986b; Lasnik and Saito 1992), case theory (Chomsky 1981, 1986b), X-bar theory (Jackendoff 1977), bounding theory (Bresnan, 1976; Chomsky 1981, 1986b) binding theory (Chomsky 1981, 1986a), and parameters (Chomsky 1981, 1986a; Roeper and Williams 1987) such as head parameter. One problem was that there is no direct evidence in the input for learning such constraints.

So the question of how we are able to learn such constraints was answered by Chomsky that we do not learn them but that they are parts of the human faculty of language. Chomsky claims that all languages have the same underlying principles.

This framework has been very fruitful. This is the first unified theory in linguistics because he proposed an explanation for how all the very different structures that we find in languages might be explained by one framework without separately establishing different grammars for each language. The grammarian's work is still important and has

to be considered, but what Chomsky did, was revolutionary in linguistics in that he said there might be a set of properties, which he terms 'universal grammar' languages have in common. This was a break with the traditional grammar, which gave a descriptive adequacy of languages. Languages were described and it was considered that languages differ in a quasi infinite arbitrary way. Chomsky had made a distinction between the *descriptive adequacy* and the *explanatory adequacy* of an empirical linguistic theory (see Chomsky 1965, 1981,1986b). In particular, if a linguist theory is to be explanatorily adequate it must not merely describe the facts, but must do so in a way that explains how humans are able to learn languages. Thus, linguistics was supposed to be embeddable into cognitive science more broadly. But if this is the case then there is a concern about the unchecked proliferation of rules, such rule systems might be descriptively adequate, but they would fail to account for how we learn languages.

This is the reason why Chomsky reduced the complexity of the descriptive grammar throughout the years. In Chomsky (1965) for example, the recursive power of the grammar is shifted from the transformations to the phrase structure rules alone. In the so-called "Extended Standard Theory" of the 1970s, there was a reduction of the phrase structure component with the introduction of "X-bar theory," and a simplification of the constraints on movement. This was followed by a number of proposals to reduce the number and types of movement rules themselves. This came to a head in Chomsky (1977, 1981a) with the abandonment of specific transformations altogether for a single rule ("move- α ") which stated, in effect, that one could move anything anywhere. This one rule was then supplemented with a number of constraints on movement. It was possible to reduce a great number of transformations to a single rule move- α and to a handful of constraints on movement.

Traditional grammars and even early generative grammars are based on constructions¹ and rules. Thus a grammar will contain rules for constructing verb phrases or relative clauses in English, and these are different from the rules for constructions in other languages. This changed totally with the Principle-and-Parameter approach (Chomsky 1981), which Chomsky (1994) describes as a breakthrough, in that it provides a new conception of language and thus a major change from a tradition of some 2500 years. Chomsky got rid of all rules, and considers constructions as taxonomic artefacts (Chomsky 1994). Thus, there are no rules of Passive, Raising, Relativization or Question Formation as there were in earlier theories. Language variation is not a matter of different grammars having different rules. Rather, the phenomena attested in different languages are deduced by variously setting the parameters of Universal Grammar. Given the interaction of the grammatical modules, a few parametric changes can result in what appear on the surface to be very different linguistic configurations. For example, some languages like Latin and German exhibit case marking and English does not exhibit case-markings. But according to Chomsky, it is not the case that English does not have case-markings, but they are not pronounced (Chomsky 1981b). According to Chomsky, languages differ but they have the same kind of computations. Principles are something all languages have in common, and languages do differ because of a limited set of parameters, which are binary (Chomsky 1981b). So a language can have either one or the other parameter. So, for example, languages are either pro-drop (pronoun drop) or not (Chomsky 1981b, Rizzi, 1986). Italian and Spanish are pro drop languages which means that we can drop the personal pronoun such as in Spanish: (Yo) voy a la playa (I go to the beach), where the personal pronoun 'yo' is usually dropped and only used for emphasis. In German, English and French the

¹ Constructions are components of sentences such as the prepositional phrase, the noun phrase, and the genitive phrase

personal pronoun cannot be dropped so we say respectively 'Ich gehe zum Strand', 'I go to the beach' and 'Je vais à la plage', and we cannot say 'Gehe zum Strand', 'Go to the beach' or 'Vais à la plage'.

The parameter, which is central to this thesis states that languages are either head-first or head-last. The head, one of the central concepts of modern syntax, is the main element in a phrase. In generative theories (Principles and Parameters, Government and Binding, and most recently Minimalism) we distinguish two kinds of phrases: lexical phrases and functional phrases. Lexical words are content words and they form a group of four types: Nouns, verbs, adjectives + adverbs and prepositions. Functional words are more or less abstract words that have a grammatical rather than a referential use. Functional phrases, directly related to function words, are built up from, for example, articles (*the* and *a*), modal verbs (e.g. *must*, *may* and *will*) attached to the main verb and pronouns (e.g. personal pronouns like *I*, *you* and *we*). Function words are called closed class words because they form a class that is limited and that hardly ever expands, unlike lexical items which are expanded each time a new word is coined for a new cultural phenomenon.

Prepositions are usually seen as a one single category and since Jackendoff (1973) it has been generally accepted that they belong to one of the four major lexical categories, along with nouns, verbs and adjectives (Rauh 1993). But the categorization of prepositions as a lexical category is quite problematic, and it can be considered as a mixed category. While the other three major lexical categories nouns, verbs and adjectives are open-class categories and can add readily new members, prepositions are seen as closed-class items. But even the categorisation of prepositions as a closed class item is not clear-cut when you consider that new prepositions can be added to the class (Kortmann & König, 1992; Vincent 1999). The category of prepositions is very

heterogeneous. Cadiot (1997) proposes two main categories of prepositions in French, which can be considered as two ends of a continuum, in which prepositions can fall. Thus, we have colourful prepositions, which have a semantic meaning and add a meaning to the phrase, while colourless prepositions don't contribute to the meaning of the phrase but are inserted due to syntactic requirements. Rauh (1993) makes a distinction between lexical and non-lexical prepositions. According to him, non-lexical prepositions have undergone some kind of grammaticalisation. Examples for functional, so non-lexical, prepositions are 'of' and 'to' according to Rooryck (1996). So, we can resume that there are lexical and functional phrases, and that prepositions belong traditionally to the first one, although this is slightly problematic.

Each functional and lexical phrase has a head. The head of a noun phrase is a lexical element, thus in the 'invasion of the barbarians' **invasion** is the head. In a genitive phrase such as 'father's car' **car** is the head. Depending on the position of the head, we then speak of head-first and head-last. In the 'invasion of the barbarians' the head noun precedes the complement and then we speak of head-first, in the genitive phrase, the head-noun follows the complement, and then we speak of head-last. Heads of functional phrases are grammatical elements. Thus the head of a prepositional phrase is the preposition. Since the preposition stands in front of the noun phrase, its head is first, and thus it is called a head-first structure. In other languages such as Japanese or Hindi, the adposition follows the noun, so we would have something like 'the station to' for 'to the station'. The head is central to the phrase and 'controls' its other parts. Such, a verb specifies its arguments. In some cases, there is a certain controversy, which is the head. The determiner as being the head of a determiner phrase is a newer invention in generative linguistics. It is assumed that languages are consistent in their head-

branching. So, a language that is head-last, has verb-final structures, postpositions, etc.

A language that is head-first has verb-medial structures, prepositions etc.

Heads of lexical phrases

	Head-first	Head-last
Noun Phrases	The <u>invasion</u> of the barbarians	Father's <u>car</u>
Prepositional Phrases	<u>Along</u> the river	Two years <u>ago</u>
Main verbs	[I] <u>see</u> the man	[Ich sage, dass ich] den Mann <u>sehe</u> (German) I say that I the man see 'I say that I see the man'

Table 1.1

Heads of functional phrases

	Head-first	Head-last
Determiner Phrase	<u>The</u> car	Om- <u>ul</u> (Romanian) Man the 'the man'
Auxiliary verb	[She] <u>can</u> come	[Er sagt, dass sie] kommen <u>kann</u> (German) He says that she come can 'He says that she can come'
Genitive Phrase	Cyninges [wif] (Old English) The king's wife	[La fille] <u>le</u> roi (Old French) the daughter the king 'the king's daughter'

Table 1.2

So, Chomsky (1981a) argues, when a child encounters that a structure is head-first, it also presumes that all other structures follow this pattern. Thus a child does not have to learn all structures with their according branching, but it encounters it once, and then applies it to all other structures in an ideal world. Radford (1990) observes that, in the acquisition of English as a first language, children even as young as 18 months old appear to set the head parameter at its appropriate head-first setting from the very earliest multiword utterances they produce.

These are assumptions of the X-bar theory (Jackendoff 1977), which attempts to identify syntactic features common to all languages. It claims that there are certain structural similarities among all phrasal categories of all languages.

The letter X is used to signify an arbitrary lexical category; when analyzing a specific utterance, specific categories are assigned. Thus, the X may become an N for noun, a V for verb, or a P for preposition.

The term *X-bar* is derived from the notation representing this new structure. Certain structures are represented by an X with an overbar. Because this is difficult to typeset, this is often written as X'. The notation XP stands for *X Phrase*, and is equivalent to *X-bar-bar* (X with a double overbar), written X'', usually read aloud as *X double bar*.

There are three "syntax assembly" rules which form the basis of X-bar theory:

1. An X Phrase consists of an optional specifier and an X-bar, in any order:

$$XP \rightarrow (\text{specifier}), X'$$

XP		XP
/ \	or	/ \
spec X'		X' spec

2. One kind of X-bar consists of an X-bar and an adjunct, in either order:

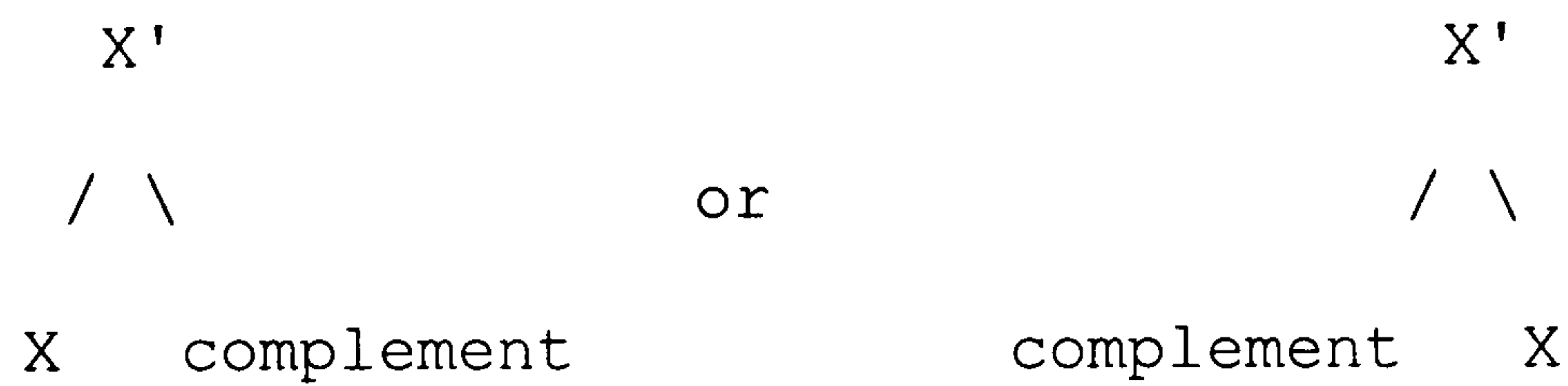
$$(X' \rightarrow X', \text{ adjunct})$$

Not all XPs contain X's with adjuncts, so this rewrite rule is "optional".

X'		X'
/ \	or	/ \
X' adjunct		adjunct X'

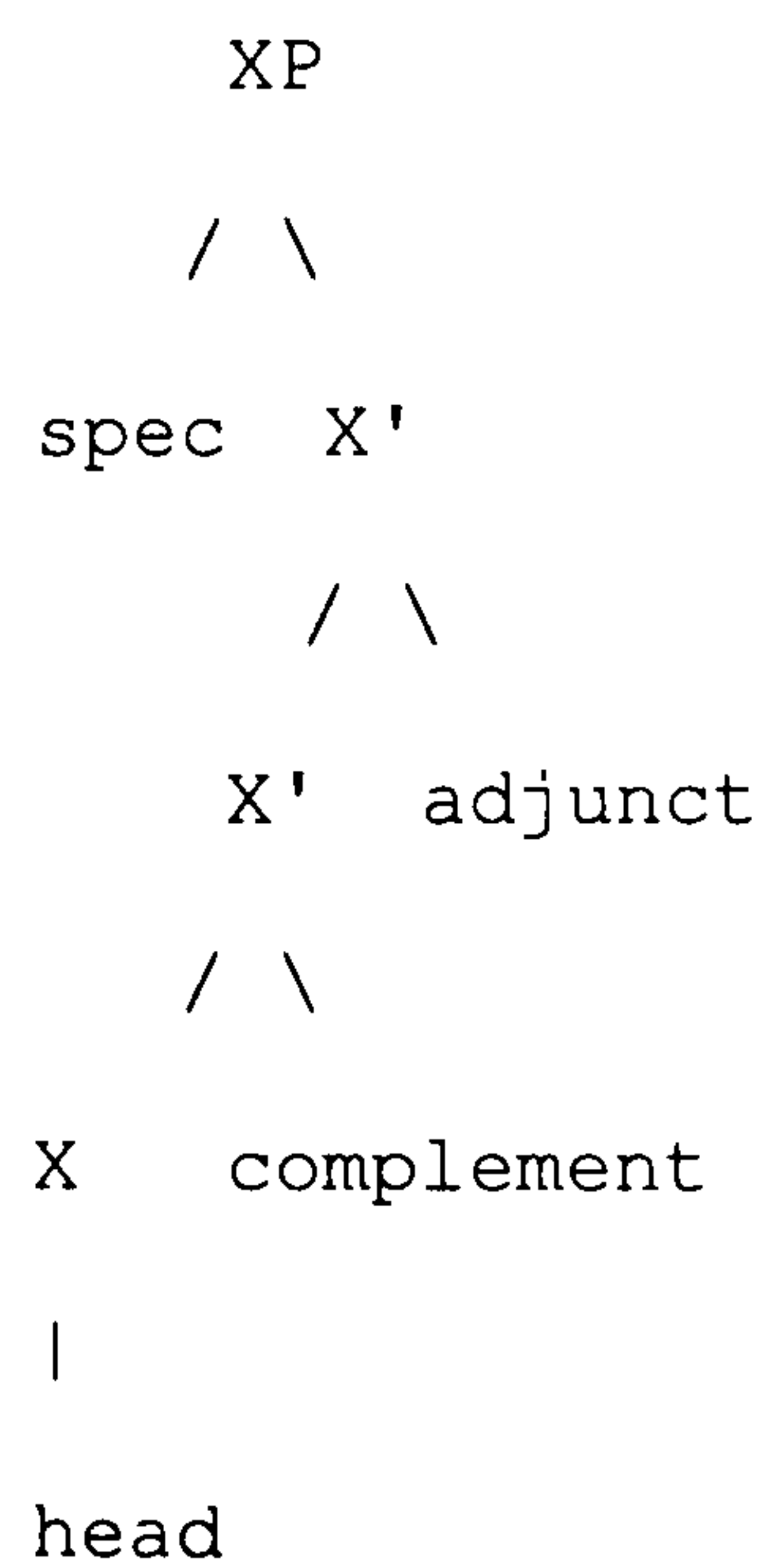
3. Another kind of X-bar consists of an X (the head of the phrase) and any number of complements (possibly zero), in any order:

$X' \rightarrow X, (\text{complement} \dots)$



(a head-first and a head-final example showing one complement)

The following diagram illustrates one way the rules might be combined to form a generic XP structure. Because the rules are recursive, there is an infinite number of possible structures that could be generated, including smaller trees that omit optional parts, structures with multiple complements, and additional layers of XPs and X's of various types.



Because all of the rules allow combination in any order, the left-right position of the branches at any point may be reversed from what is shown in the example. However, in any given language, usually only one handedness for each rule is observed. The above

example maps naturally onto the left-to-right phrase order used in English. This branching-direction is usually called right-branching, while Japanese would be left-branching:

“We assume that orderings are determined by a few parameter settings. Thus in English, a right-branching language, all heads precede their complements, while in Japanese, a left-branching language, all heads follow their their complements; the order is determined by one setting of the head parameter.”

Chomsky & Lasnik (1993:518)

Although most languages are rather consistent, we find in most languages some inconsistencies according to Kroch (2000), which means that there is a mixture between head-first and head-last. Only a few languages such as Japanese or Irish are totally consistent, but in most languages, we find such exceptions. Now, we come back to exceptions, and we said before that they need explanation and should be explained by the theory, thus they challenge the theory.

So, one way of explaining these exceptions in linguistics was by saying that these are the result of language change, which is not completed yet. So the scenario is the following: A consistent head-last language starts changing. So, some structures start changing into head-first structures. This process, which can take several centuries, would finish when the language is ideally head-first. In the mean-time, we still have residual head-last structures that have not yet undergone the process of change.

This explanation seems to fit with data of language change, but is problematic for several reasons. First, in most languages we have some kind of inconsistencies and why should we assume that in earlier periods languages looked different. Then, children acquire a language, why should they learn something that is inconsistent, when consistency is easier, and this is an important question since acquisition is considered as

the motor for language change by generativist linguists such as Lightfoot (1999, 2002) and Yang (2001). Adults are considered in Chomskyan linguistics to have achieved a stabilised grammar because they passed the critical period. Children, on the other side, set their parameters according to the input they hear in their early years and ambiguous data can lead to a reanalysis.

A language must be learnable for children. So, if UG contains head-order constraints, then mixtures of head-orders should either be impossible or in the case of language change, when languages are going through a period of transition when they change from one type to another, we would expect that the language would convert to a 'totally' consistent type in 1-2 generations since a language with a mixed set of head-last and of head-first is harder to learn and children are expected to assimilate all structures to a single head order. Indeed Chomskyan linguists claim that language change is rapid and abrupt. Children reorganise ambiguous data in such a way that change is catastrophic (Lightfoot 1997). According to Lightfoot (1997, 1998), children set their parameters according on cues that they find in the input in unembedded structures. Abrupt catastrophic changes take then place when those cues are expressed below some threshold of robustness. Lightfoot says that the distribution of a cue might change because of language contact or socially defined speech fashions. Children reanalyse then the input according to the evidence in the input of their parent's and other adult's speech. Such a reanalysis happened in French, which used to be a verb-second language, and became reanalysed into an SVO-language. Old French had a verb-second structure. Verb-second means that the finite verb appears in second position. It can be preceded by an adverb, a subject or an object as it is still the case in Modern German:

1) Heute kaufe ich eine Blume
 Adverb Verb Subject Noun
 Today buy I a flower
 1 2 3 4

2) Ich kaufe eine Blume
 Subject Verb Noun
 1 2 3

3) Eine Blume kaufe ich
 Object Verb Subject
 1 2 3

There are languages, which only allow the order SVO, a preposed element if possible would not alter the canonical order such as it is the case in Modern French:

4) Aujourd'hui j'achète une fleur
 Adv Subject Verb Object
 Today I buy a flower

5) J'achète une fleur
 Subject Verb Object
 I buy a flower

In Modern French the object can be preposed by applying the structure *c'est ... que*, the canonical order SVO is thus preserved:

6) C'est		une fleur	que		j'achète
Subject	Verb	Object	Subordinator	Subject	Verb
This	is	a flower	that	I	buy

SVO can be analysed as a structure belonging to a verb-second language as it is the case in 2), but it can be as well a different word order pattern as it is the case in Modern English, where it is the only allowed order with exception to rudimentary verb second structures as in: *Never will I see you again*. But usually an adverb simply precedes the subject in English such as in *'Today I go to work'* in Modern English, while in a V2-language it would be *'Today go I the way*. We can see that the SVO-sentences in a V2-language could give way to reanalysis if the frequency of this sentence type increases. According to Roberts (1993), we had verb-second structures and pronouns that could be dropped in Old French (pro-drop):

Null-subjects:

7) *Si firent grant joie la nuit*

Thus (they) made great joy the night (Clark and Roberts (51c))

Verb-second

8) *Lors oïrent ils venir un escoiz de tonnoire*

Then heard they come a clap of thunder (Clark and Roberts 1993 (51d))

The reason that French lost V2 is found in the fact, according to Yang (2001), that French used to be a pro-drop language. When we have a null subject as in a), we can interpret this sentence both as a verb-second and as an SVO-sentence. In V2-languages such as German or Dutch, 70% of main clause sentences are SVO, and 30% exhibit a V2-structure. In these languages, V2 is stable because null subjects are not possible. In French, null subjects make the V2-interpretation more difficult, and learners go for the more frequent SVO-structure, without interpreting it as a verb-second structure but as the basic word order. We see that reanalysis is possible. We also see that these changes occur because of sociolinguistic factors. In Old and Middle French, we had verb-second and the possibility of pro-drop. The reason why persons use pro-drop as in structure a) and not pronounce the pronoun must be because of pragmatic reasons. Greenfield and Smith's (1976) principle of informativeness suggests that children tend to encode those aspects of the event that are most informative. On the other hand, children tend not to encode those aspects of the event that are presupposed, such as the subject and the agent. So, we see that structures might change but not have to change and that factors like language contact and pragmatic factors surely play their role, and can trigger subsequently language change. Since this change is due to reanalysis in children's acquisition, the change is rather rapid.

There is indeed evidence in creolisation that children complete the pidgin of their parents, which is a primitive communication system and cannot be considered as a language yet, into a complete language in a relatively short time or even in a single generation (Bickerton 1984, 1998). This is also supported by evidence from the acquisition of sign language, where children are often exposed to unnatural input and alter the code in such a way that a full language develops (Goldin-Meadow & Mylander 1990; Newport 1998; Supalla 1990).

But, language changes are usually gradual and can take centuries and some structures of the older type still seem to remain. Although Indo-European languages had a drift from SOV towards SVO, we still find structures that fit with SOV-languages in those languages. And indeed, some disharmonies like the Saxon genitive, which is inconsistent with the major Norman genitive does not seem to be about to change (see chapter 4.2). Another example is the existence of both verb-final and verb-medial structures in Old English. We would expect then, that children would opt in a generation for one solution considering the catastrophic changes established by Lightfoot. Some linguists explained these phenomena by saying that individuals might have two grammars, as it is the case for bilinguals, and that a same individual might switch between these grammars as it is generally the case with code-switching. These grammars are then in competition and one grammar might take over the other (Kroch 1989, 1994; Yang 2001, Pintzuk 1990). Although Kroch and Pintzuk claim that these changes are constant, Lightfoot (1999) thinks that they are rather catastrophically as well.

The Chomskyan view on language change opposes to the one of linguists with a functional view on language change, especially the adherents of grammaticalisation studies (Haspelmath 1994, Hopper & Traugott 1993). In grammaticalisation studies, it is assumed that lexical elements get grammaticalised into function words or grammatical items and morphological morphemes. Language changes in a unidirectional way from the less grammaticalised to the more grammaticalised and from the more concrete to the less concrete (Haspelmath 2002). According to Haspelmath (2002), grammaticalisation is also the development of fixed patterns, i.e. phrases and more broadly word order out of discursive structures, which are looser.

One main difference to the generativist point of view is that adults are considered of playing a major role in language change. Language changes because it is used. Thus language changes because of its pragmatic pressures. Under this view, a construction arises because of extravagance (Haspelmath 2000), prestige (Haspelmath 2002) and other social and pragmatic functions such as group identity (Croft 2000), expressiveness (to be noticed, to be amusing, to be charming, cf. Keller (1994), which leads to linguistic innovations such as the more poetic usage of language like the creation of metaphors. A person uses for example the verb 'to go', which till then only expressed the verb of motion for a near future, where the movement initially still can be considered such as in: 'I am going to buy things'. Gradually the usage gets generalised and we can even use it in such circumstances, where no motion can be identified, such as in: 'He is going to correct the paper'. If a linguistic innovation is considered as being prestigious, it is very likely that a lot of individuals will integrate it in their daily language because everyone wants to participate in the gain of prestige, which can lead very similar as in economics to inflational phenomena (Haspelmath 2002, Dahl 2001). After a while the new valuable prestigious term is so frequent that then it is basically worthless. Haspelmath (2002) explains why grammaticalisation must be unidirectional with the support of inflation. Since the term gets more frequent, it gets more easily memorised and leads to construction of patterns. The process is unidirectional and the reverse does not happen because speakers do not have an interest to use frequent, socially unprestigious material to impress others (Haspelmath 2002).

So, we can see that we have two Kuhnian paradigms in Linguistics, which are incommensurable as we can see in table 2.

According to grammaticalisation theories language does not change because of acquisition as generativists assume it, but because of language use. Frequent structures are more likely to be grammaticalised, because their usage is more frequent.

Language change is considered to be gradual in grammaticalisation studies, which again stands in opposition with generativism. Structures change gradually, which stands in a function with usage. The third big difference to the generativist point of view is then that the change is unidirectional (Haspelmath 1994), from lexical items towards grammatical ones and less grammaticalised items towards more grammaticalised ones. Generativists such as Lightfoot (1999, 2002) argue against it because according to him acquisition cannot be data-driven. Lightfoot gives as evidence catastrophic changes such as creolisation and offers his cue-theory, which implies that children scan the input for cues that help them to set parameters. In this sense, E-language has a very modest function, in the sense that adult use can influence children's acquisition if in the adult input a cue is not frequent enough. So, speech fashion might change the input, but language changes because of reanalysis in language acquisition according to Lightfoot's view. For the same reason directionality is not a valid concept for Lightfoot because a language can change in all directions, it only depends on the triggering cues and the subsequent parameter setting. Croft (2000) criticises as well the child-based approach of generativism because the kinds of errors children commit in their acquisition are very different from the changes attested in historical changes in language. According to him, children do not change language, but are extremely good at unlearning errors even without negative evidence. Children do finally match input according to Croft (2000) and they adapt their language to their parents and older peer. Croft does not share the view of generativism that adults do not alter their grammar at an adult age. Adult speakers adjust their use of variant sounds and accents, words and constructions.

Comparison of Generativism and Functionalism

Language change depends on:	Generativism	Functionalism
Language use	Can be a consequence or a trigger for language change, but not primary factor: no	Yes
Sociolinguistic preferences (Prestige)	No	Yes
Innate settings	Yes	No
Children	Yes	No
Adults	No	Yes
Unidirectionality	No	Yes
Graduality	No	Yes

Table 1.3

From a generative point of view, inconsistencies of head-order are problematic and they should not emerge and once they emerge, for example through intensive language contact, we should assume that a catastrophic change would take place such as it is assumed to happen in the case of creolization. But since this is not always the case, we could assume that inconsistencies are not structures that are about to change and eventually under 'evolutionary' pressure, but rather a structure that is learnable and well integrated in the ensemble of the whole language system. So, if we accept that inconsistencies can surely emerge in the language system through language change, but

that they are learnable structures and belong entirely to the language system and that we cannot be sure that they will be replaced by consistent ones, then we must explain them in the theoretical framework. Unidirectionality seems to be an important aspect in language change, but it is incompatible with a generativist point of view, where children set parameters.

From the point of view of grammaticalisation studies, the overall tendency for head-order and branching consistencies might be a challenge. Grammaticalisation does not explain why there should be an overall statistical tendency for harmony. The grammaticalisation of one structure such as the emergence of prepositions does not entail that all structures would change in such a way that they would follow a new head preference.

Although unidirectionality is controversial in linguistics, the change from head-last towards head-first seems to be universal, and the opposite has only been observed in the case of strong language contact (Bichakjian 1991).

As we will see, there are only a few exceptions observed in the unidirectional change. But as in the case of biological evolution of species, exceptions of the general trend need an explanation. In evolution usually those mutations that give the species an advantage for survival is of benefit. The male peacock has a large tail, which can be lifted in courtship. Such a tail is not an advantage of survival since it is heavy and slows down the male peacock. But it tells the female that a peacock that has a beautiful tail must have good genes if he could survive till sexual maturation with it. This paradox is called the Zahavi's handicap principle (Zahavi, 1975, 1977).

We need also find explanations in linguistics if we find cases in language change that seem to contradict theory. Linguists are aware of this, and in grammaticalisation, there is a discussion going on how certain exceptions to the unidirectional trend could be

explained or if they are per se exceptions (Haspelmath 2000). As mentioned before, in language change, where we only have a unidirectional trend towards SVO, only a few exceptions have been found. We will look at one in German, which is the introduction of postpositions in German. Postpositions usually occur in head-last languages, thus languages, which have a basic SOV-order. German developed more and more towards an SVO-type and had predominantly prepositions, when in the 17th century postpositions reoccurred. This was seen as a retrograde change (see Bauer 1995a). We will show in a diachronical and experimental study that this is not contrary to unidirectionality. Rather processes of grammaticalisation were responsible. German still continued to develop further right-branching structures.

Another important question is how to deal with different frameworks that seem to be valid and explain in their scope the linguistic reality as it is the case with functional and generative approaches. The outcomes are very different and it would be useful to know how important language use or acquisition is or if there is an interaction and thus both frameworks might work for certain studies. Is unidirectionality a valid concept or is it a rather random change depending on parameter settings? Is there a possibility to combine both views, such as a unified theory? In this thesis, we will consider both views.

In the following, we will look at mixed word order phenomena such as we find it in German, where the finite verb is in medial position in main clauses but in final position in subordinate clauses can be explained in Chomskyian linguistics by movements (see Travis 1984). The verb is in final position and moves to the complementizer in German. When a complementizer is present this movement is blocked, and the finite verb stays in final position. Lightfoot argues that a syntactic cue such as infinite verb elements triggers the information for the child to know that the verb phrase is head-last. We

attempt to show in a case study that inconsistencies in German word order can be acquired through the mean of a 'syntactic cue' as we will see in chapter 6 and 7 by studies involving SRN-simulations and experiments. This thesis is structured in seven chapters. The present chapter gave an overview of the contents of this thesis. In Chapter 2, we will discuss language universals and exceptions to those. In chapter 3, we see then how the concept of 'syntactic consistency' and subsequently 'syntactic inconsistency' is defined in cognitive sciences and linguistics. Then we will see how some inconsistencies developed especially in the example of the passage from Latin to French. Language change seems to be systematic in the sense that languages change from head-last towards head-first languages. We also say referring to their branching that languages change from left-branching towards right-branching languages or referring to their basic word order from the SOV to the SVO-type. We will see that languages change from a basic OV-type to a basic VO-type, while the change is not complete, and thus we are confronted with inconsistencies. In chapter 4, we give further examples of diachronic development at the example of the German Noun Phrase. In chapter 5, we will discuss a so-called exception of diachronic development, and we will show that we do not necessarily have to speak of a retrograde change. In Chapter 6 and the following chapters, we will see how inconsistent structures in German verb phrases, especially a statistical minor word order can be acquired through the mean of a syntactic cue. In chapter 6, we begin by discussing the acquisition of the verb phrase in first and second language acquisition.

We will see at the example of Old English that the finite verb cannot be in medial position when the infinite verb is in final position. We will see that the final infinite verb in main clauses assist the acquisition of subordinate clauses. We first tested this in an SRN-simulation. A Simple Recurrent Network (SRN) is a feedforward neural

network with an extra layer of context units that is used for sequential learning in cognitive and linguistic domains. In Chapter 7, we will see in two experiments how the infinite verb can assist the acquisition of German subordinate clauses. The first experiment was in a kind of ‘Weird English’ simulating German word order. The second experiment was done in French, basically because the distinction between finite and infinite verbs is more complex because of richer morphology in French. We will see that the richer morphology helps additionally acquiring verb-final subordinate clauses.

Summary

We discussed the importance of having a unified theory in linguistics. We have seen that traditional grammar assumed that constructions in languages are arbitrarily different. Chomsky unified the studies of syntax and phonology in that he assumed that languages exhibit the same underlying system, which is due to the language learning faculties of humans. This approach has been fruitful since it gave a new scope of inquiry in linguistics, and it was investigated what makes us able to learn languages and what properties do languages have. This generative framework was wide ranging in the sense that it was applied in typology, acquisition, diachronic studies of syntax and phonology, acquisition as well as pathology, which is not considered in this thesis. The assumption that the syntax of languages differ only minimally in the few setting of parameters has also some complications. It is assumed that a learner sets the value of one parameter, such as head-first and head-last. But in many languages we find a mixture of both. This could challenge the theory if it cannot be explained in this framework.

Chapter 2

Universals in Word Order

2.1 Distribution of Word Order patterns in the world's languages.

According to Cook (1990), the verb phrase, thus the verb and its complement, cannot be separated according to the order principle: (VO)S, S(VO), S(OV) and (OV)S are normal, but OSV and VSO are odd in that S interrupts the VP constituent. This means that subjects come outside verb phrases. This corresponds to the Operating Principle D in Slobin (1973), “avoid the interruption of linguistic units”. Further on Cook says that languages like OSV and VSO are derived by the classic X-bar account “by movement of the Verb from a final position: VSO is underlyingly SOV, and so does not break the order principle”.

Languages, which subjects precede an object are much more frequent than languages, which objects precede subjects. SO languages, i.e. SOV, SVO, and VSO. OS languages, i.e. VOS, OVS and OSV² are relatively rare. OVS and VOS languages, which fit the order principle, are very rare in the world's languages respectively, while VSO, which breaches the order principle, is significantly more frequent. OSV is the least frequent language type.

² It has been assumed for a long time that OSV languages do not exist. But there is growing evidence that some languages in the Amazon region rely primarily on OSV (Derbyshire, 1986).

Basic word order frequencies in two language samples

	SOV	SVO	VSO	VOS	OVS	OSV	Unclassified
Ruhlen (1975)	51.5%	35.6%	10.5%	2.1%	0	0.2%	--
Mallinson & Blake (1981)	41%	35%	9%	2%	1%	1%	11%

Table 2.1

As we can see we find more SOV languages than SVO languages, which might suggest that proto-languages, the earliest human languages, started off with an SOV-basis (Newmeyer 1991).

Baker (2001) suggests that the frequency of language types corresponds to the number of possible parameter settings:

“Since the difference between English-style and Japanese-style word order is attributable to a single parameter [Head Directionality], there is only one decision to make by coin flip: heads, heads are initial; tails, heads are final. So we expect roughly equal numbers of English-type and Japanese-type languages Within the head-initial languages, however, it requires two further decisions to get a verb-initial, Welsh-type language [the Subject Placement Parameter and the Verb Attraction Parameter]: Subjects must be added early and tense auxiliaries must host verbs. If either of these decisions is made in the opposite way, then subject-verb-object order will still emerge. If the decisions were made by coin flips, we would predict that about 25 percent of the head-initial languages would be of the Welsh-type and 75 percent of the English type. This too is approximately correct ...”

Baker (2001:134)

Newmeyer (2005) disagrees with Baker’s view:

“There are serious problems as well with the idea that the rarity of language types is positively correlated with the number of ‘decisions’ (i.e. parametric choices) that a language learner has to make. Baker’s discussion of verb-initial languages implies that for each parameter there should be a roughly equal

number of languages with positive and negative settings. That cannot possibly be right. There are many more non-polysynthetic languages than polysynthetic ones, despite the fact that whether a language is one or the other is a matter of a yes-no choice. The same point could be made for subject-initial head-first languages vis-à-vis subject-last ones and nonoptional polysynthetic languages vis-à-vis optional polysynthetic ones.”

Newmeyer (2005:§3.2.2.4)

According to Newmeyer (2005), UG characterizes the class of ‘possible languages’, but not the class of ‘probable languages’. UG specifies only the general form of grammar, the interrelationship of components and the possible grammatical constraints and rules. The frequency of grammars can only be explained by performance and parsing principles according to Newmeyer (2005). There is nothing in UG per se that explains why SOV-order is more common than OSV order or why prepositions stranding is rare.

2.2. Word Order Universals following Greenberg

Greenberg (1968) showed in a study of 30 languages on 5 continents that these languages despite their apparent diversity have a few universals concerning their word order patterns in common, i.e. 45 universals. He comments that many of these universals are implicational:

“A large proportion of these [universals] are implicational; that is, they take the form, ‘given x in a particular language, we always find y’. When nothing further is said, it is understood that the converse, namely, ‘given y, we always find x’, does not hold. [...]. [...]. [What] seem to be nonimplicational universals about language are in fact tacitly implicational since they are implied by the definitional characteristics of language.”³

³ Greenberg (1968), p. 77

Greenberg (1968) defines in his work absolute universals and statistical universals. Absolute universals do not have any exceptions, while statistical universals do have exceptions but only a few and we have a tendency towards the universal as argued. The absolute universals as defined by Greenberg (1968) are problematic since when one exception for an absolute universal is found this universal must be classed as a statistical universal. It can never be excluded that any absolute universal be statistical. Even if we had knowledge of all the present and dead languages in the world, this would still be true, since it could be that there might be an exception to a universal in a language that so far did not exist. The probability for something like this to happen would be indeed very low. As we will see there is even an example of a statistical universal, which turns out to be no universal at all. We will see these points in the following.

Greenberg (1968) recognised that the most dominant orders are SVO, SOV and VSO. They have in common that the subject precedes the object, and this is Universal 1 of Greenberg:

Universal 1. In declarative sentences with nominal subject and object, the dominant order is almost always one in which the subject precedes the object.

Universal 1 has been confirmed by later research (Tomlin 1984, Clark and Clark 1978, Ruhlen 1975, Mallinson and Blake 1981).

Greenberg (1968) speaks of a “basic order typology”. This typology consists of three properties. First a language has prepositions or postpositions. Second, a language has a typical order of genitives and nouns, and third the order of adjectives and nouns. In the construction of these properties we find patterns, which again can be formulated in

universals. So, Greenberg (1968) recognised that in languages with postpositions, the genitive precedes the noun, whilst in languages with prepositions the reverse is found:

“Universal 2. In languages with prepositions, the genitive almost always follows the governing noun, while in languages with postpositions it almost always precedes”⁴

All VSO-languages have prepositions. This is an absolute universal.

“Universal 3. Languages with dominant VSO order are always prepositional.”⁵

Dryer (1998) checked this universal and found the following:

Table: VSO and prepositions

	Africa	Eurasia	SEAsia& Oc	Aus- NewGui	Namer	Samer	Total
VSO&Pr	7	1	2	0	9	1	20
VSO&Po	1	0	0	0	2	2	5

Table 2.2

So, since we find VSO with postpositions we cannot speak of an absolute universal, but probably we can assume a statistical universal. So, VSO is like SVO, in both word orders we have a statistical tendency towards prepositions.

⁴ Greenberg founds as an exception Norwegian (Greenberg (1968)), p. 78.

⁵ Greenberg (1968), p. 78.

While VSO-languages only use prepositions according to Greenberg (1968), it is the reverse case for SOV-languages, although Greenberg supposes that there are exceptions for SOV-languages.

“Universal 4. With overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional.”⁶

Universal 4 is a statistical universal and it has been confirmed in the literature (for example Dryer (1992, 1998)).

Since, according to Greenberg (1968), in VSO-languages all prepositions precede nouns, the adjective also follows the noun without exception. In SOV-languages on the other side adjectives are expected to precede the noun. According to Greenberg (1968), this is the case, but there are exceptions:

“Universal 5. If a language has a dominant SOV order and the genitive follows the governing noun, then the adjective likewise follow the noun.”⁷

Dryer (1992:95) considered whether in SOV-languages the adjective precedes generally the noun as Greenberg should expect it:

⁶ Greenberg (1968), p. 79.

⁷ Greenberg (1968), p. 79.

Table: OV and adjective

	Africa	Eurasia	SEAsia& Oc	Aus- NewGui	NAmer	Samer	Total
OV&AN	7	24	2	4	10	8	55
OV&NA	18	4	5	15	18	14	74

Table 2.3

Table: VO and adjective

	Africa	Eurasia	SEAsia& Oc	Aus- NewGui	NAmer	Samer	Total
OV&AN	3	6	4	5	19	3	40
OV&NA	25	3	12	2	8	5	55

Table 2.4

There is no tendency of adjectives preceding the noun, and hence Universal 5 is not confirmed, even as a statistical universal. The number of SOV-languages with adjectives following the noun is even higher. So, we cannot assume a statistical universal here. Both orders AN and NA are more or less equally present, with a relatively higher number of NA-structures occurring.

VSO-, SVO- and SOV-languages have in common that the subject precedes the object, but despite these properties in common VSO- and SOV-languages in particular differ in many ways. According to Holenstein (1985) and Greenberg (1968) SVO is a transitional phase between VSO and OVS. Dryer (1992) states that SVO and VSO

exhibit very similar structures. Since he has a much bigger language sample, we might assume that he is right and thus simply make the difference between OV and VO-languages.

Dryer (1992) argues against the head-dependent theory and suggests a branching direction theory according to which a language is either right-branching or left-branching. A verb patterner is according to him an element that exhibits the same order as the verb and respectively an object patterner that exhibit the order of an object. According to his data the following structures correspond to the head-complement theory.

Table: Correlation pairs

Verb patterner	Object patterner	Example
Noun	Genitive	Father + of John
Adjective	Standard of comparison	Taller + than Bob
Verb	PP	Slept + on the floor
Verb	Manner adverb	Ran + slowly
Copula verb	Predicate	Is + a teacher
'want'	VP	Wants + to see Mary

Table 2.5 (Dryer 1992:91)

The next list shows controversial pairs. The HDT makes the correct prediction for those if the verb patterner is the head, but there are according to Dryer (1992) different mainstream proposals.

Table: Controversial pairs

Verb patterner	Object patterner	Example
Tense/aspect auxiliary verb	VP	Has + eaten dinner
Negative auxiliary	VP	Diegueño: ? -u ya w x ? Əma w x. I know FUT I-not-Fut 'I won't know'
Complementizer	S	That + John is sick
Question particle	S	Mokilese (Austronesian): A koah sihkei? Q you well? 'Are you well?'
Adverbial subordinator	S	Because + Bob has left
Article	N'	The + tall man
Plural word	N'	Gbeya: O tu wi-re Plural black person 'black people'
Verb	Subject	(there entered) a tall man

Table 2.6 (Dryer, 1992:100)

The following list shows items, which are noncorrelation pairs. This means that they do not correlate in order with the verb and the object. They are a problem for the HDT, which predicts that the head should be a verb patterner.

Table: Noncorrelation pairs

Dependent	Head	Example
Adjective	Noun	Tall + man
Demonstrative	Noun	That + man
Intensifier	Adjective	Very + tall
Negative particle	Verb	Not + go
Tense/aspect particle	Verb	Kiowa: Hego pay min yi-ya Now sun about to disappear-IMPF 'The sun is about to set'

Table 2.7 (Dryer 1992:95)

In the tables 2.5 and 2.6 presented here, all verb patterners are nonphrasal and the object patterners are phrasal. In table 2.6, neither of the elements is phrasal or both elements are nonphrasal, and are thus a contradiction for the HDT. Dryer solves this problem in suggesting the Branching Direction Theory (BDT):

Verb patterners are non-phrasal (non-branching, lexical) categories and object patterners are phrasal (branching) categories. That is, a pair of elements X and Y will employ the order XY significantly more often among VO languages than among OV languages if and only if X is a nonphrasal category and Y is a phrasal category.

(Dryer, 1992: 109).

Languages tend towards one of the two ideals according to the BDT: right-branching languages, in which phrasal categories follow non-phrasal categories and left-branching languages, in which phrasal categories precede non-phrasal categories.

But adjectives are often understood to be phrasal. Dryer (1992) discusses this in more detail and suggests that adjective phrases fall into three types:

- a. modifier + Adjective - very tall
- b. conjoined APs - tall and rather thin
- c.. Adjectives with dependent phrase - bigger than houses
 - eager to help others
 - afraid of the consequences

Only (c) of the three types presented is a fully recursive phrasal category, that is, one that can dominate other major phrasal categories. (a) and (b) must precede the noun, while (c) follows the noun, which fits with the right-branching structure of English, considering that the noun is the non-phrasal category and the following adjective phrase the phrasal category.

Dryer makes the distinction between major and minor constituents. A minor constituent is a constituent that is of the same category as its dominating node and that serves as head of that node. A constituent that is not a minor constituent is a major constituent.

Only major constituents are relevant for the BDT. An adjective phrase such as in ‘a good picture of John’ would be a minor constituent and thus not be relevant for the BDT. The adjective is combining with a non-phrasal noun and is not fully recursive.

According to Dryer (1992), this is very different for the article, which combines with a

noun since it creates a distinct category. The article combines with a fully recursive phrasal category, which is not a minor constituent, while the adjective does not.

Following this, Dryer (1992: 114) suggests a revised version of BDT:

The Branching Direction Theory (revised): Verb patterners are non-phrasal categories or phrasal categories that are not fully recursive, and object patterners are fully recursive phrasal categories in the major constituent tree. That is, a pair of elements X and Y will employ the order XY significantly more often among VO languages than among OV languages if and only if X is not a fully recursive phrasal category in the major constituent tree and Y is a fully recursive phrasal category in the major constituent tree.

The Branching Direction Theory says that there is a preference for consistent left- or right-branching. Alternate branching leads to center-embedding. This account is different from the branching direction proposed by Chomsky, where branching depends only on the head-parameter.

Implicational universals vs binary parameter setting

Greenberg assumes at least theoretically that there are absolute universals. In Government and Binding, Chomsky assumes that languages have principles and parameters. Principles are invariable in all languages, they are thus assumed to be absolute. Parameters, as we have seen, are binary. When the verb phrase of a language is head-last, i.e. the verb is in final position, then all the other phrases in this language should be head-last. So, this language should then have postpositions, a head-last noun phrase etc. Greenberg, on the other side, established implicational universals.

Implicational universals allow three out of four language types, while parametrical universals only allow two out of four. In OV-languages, we find predominantly a GenN-structure, while both GenN and NGen can occur in VO-languages. A parametrical universal such as we find prepositions in VO-languages and postpositions in OV-languages give us only two types out of four. According to Kirby (1999) both types can be found in Greenberg's work.

Greenberg's implicational universals can be absolute or statistical, while Chomsky's parameters should be absolute in the sense that there should be 'harmony' in the parameter setting. Kirby (1999) points out that parameters can also express implicational relationships in the case of a multi-valued parameter or a set of binary parameters by citing a study on the constraints on the positions of anaphors and their antecedents by Manzini and Wexler (1987).

We have seen that Greenberg's absolute universals are critical in the sense that there might be an exception, and then we have to speak of a statistical universal. One explanation is that the emergence of such exceptions is a result of language change as we will see in the following.

2.3 Word Order Universals and Diachrony

Hawkins (1979) discusses two basic hypotheses of language universals and how they developed in language change. The fact that languages tend to have universals that are statistically relevant, made Hawkins (1979) postulate two main hypothesis. P stands for

VO order, Q for the other properties of VO languages, -P for OV order, *P for the change from OV towards VO, and -Q for the other properties of OV-languages.:

1) The Universal Violation (or Trigger Chain Hypothesis (UVH)):

Languages violate synchronic implicational universals of the form 'If P, then Q' by evolving *P & -Q co-occurrences. Such co-occurrences trigger a chain of subsequent word order changes which re-introduce consistency, as languages acquire whatever Q properties are observed to co-occur with P on synchronic evidence.

The basic state of language is assumed to be -P & -Q here. When such a language changes, and introduces VO-patterns, it is inconsistent *P & -Q. According to this hypothesis, -Q got under pressure and changes into Q. So, inconsistencies are seen here as an intermediate stage from the change of one language type to another. This theory has to be attributed to Lehmann (1971, 1972) and Vennemann (1974).

The second claim, according to Hawkins (1979), would be:

2) The Universal Consistency Hypothesis:

At each stage in their historical evolution, languages remain consistent with synchronic universal implications.

Hawkins (1979) tries to make finer predictions in that he assumes that language change is still more complicated than outlined above. Not all constituents change immediately in the same time. A language does not turn out to be VO from one day to another. It is a gradual shift. Hawkins takes minority structures into account and according to him, when there are minority structures P, then there must be minority structures Q. This

theory is reflected in two hypotheses. The Doubling Acquisition Hypothesis (DAH) and the Frequency Increase Hypothesis. In the Doubling Acquisition Hypothesis, it is assumed that a doublet of a structure can exist. So, we can have as a 'doublet' for example a head-last genitive structure 'Gen N' a head-first genitive structure 'N Gen' (the noun being the head).

The Doubling Acquisition Hypothesis (DAH):

Given a set of synchronic implicational universals of the form 'If P, then Q', where P and Q are basic word orders of certain specified types; then, at two successive stages in the growth of a language,

IF: P is acquired as a doubling structure from the earlier uniquely -P stage

THEN: EITHER Q must already be present at the earlier stage (whether as a doublet with -Q or not),
OR, if it is not present, Q must be acquired as a doubling structure simultaneously with P. But P will not be acquired in the total absence of Q.

The Frequency Increase Hypothesis (FIH):

Given a set of synchronic implicational universals of the form 'If P, then Q', where P and Q are basic word orders of certain specified types; then, at two successive stages in the growth of language,

IF: (a) there is an increase in the frequency of P structures relative to their doublets - P, and if (b) the frequency of the Q structures at the earlier stage, prior to the increase in P, was less than 100% (i.e., -Q doublets existed),

THEN: the implied Q structures will also have gained in frequency along with P by the later stage.

These accounts aim to describe why languages exhibit inconsistencies in taking language change into account. We have seen that exceptions might be elements that did not undergo the current change or they might be recent changes while others did not undergo the change. In the following, we will examine these exceptions, which are usually called 'inconsistencies' and we will discuss how they might develop.

Summary

In Chapter II, we have first seen how word order patterns are distributed in the world's languages. Then, we moved to the universals of Greenberg. The universals can be absolute or statistical. Absolute universals are valid as long as no exception is found. Many of these universals are implicational, which differs from Chomsky's assumptions about parameter setting. We also have seen an alternative to the Head-dependent parameter, which is Dryer's branching theory, which takes into account that we do not find consistent settings cross-linguistically for some elements as it is the case for adjectives. Then we moved to 'universals and diachrony'. Here it is assumed that a language can have exceptions to the established universals because it is changing from one language type to another.

Chapter 3

Inconsistencies

3.1 Introduction

As we have seen in chapter II before, there has been great interest in universal patterns of language. Greenberg established universals such as when a language has an SOV-order its genitives most likely precede the noun. If this is the case adjectives also should precede the noun. Jackendoff (1977) explained such phenomena later on with X-bar-theory, which Chomsky (1981a) integrated within the Government and Binding Program. If a language is head-first, it has all its heads in first position, which results in a right-branching structure, while when a language is head-last, it has all its heads in last position and so we will find a left-branching structure. Japanese for example is a head-last language and English is a head-first language. So if a language is SOV, its noun phrase also should be head-last, so one would find the adjective in front of the noun in such a language, but as we have seen in chapter II this is not always the case. The idea of Hawkins is that if a language has a mixed pattern in its branching, thus their head-complement ordering, it is more difficult to learn. According to Lehmann (1971), languages that have a mixed order according to their head-complement ordering are particularly useful for the understanding of syntax because it would allow us to determine the forces of syntactic relationships, which are correlated with the

arrangement of phrases, and this is especially true, so Lehman, if such “inconsistent languages are undergoing change”.

3.2 ‘Inconsistencies’ in psycholinguistics and cognitive sciences

Languages, which are head-first languages such as English or French tend to have prepositions whilst languages which are head-last tend to have postpositions such as for example Japanese. Inconsistencies create center-embeddings and this puts load on the short-term memory and makes it more difficult to parse.

These are then implications of Hawkins’s parsing theories (1990, 1994). According to Hawkins structures that place the least load on short term memory are easier to parse.

First of all we have to explain what a mother node constructing category is (MNCC). A MNCC is a terminal node, a word or possibly a morpheme, that uniquely determines a mother node. One type of MNCC is a lexical head. Thus:

N uniquely determines NP

V uniquely determines VP

P uniquely determines PP, and

A uniquely determines AP

Another type of MNCC consists of function words:

Comp determines S’

Aux determines VP,

Det determines NP (or DP).

He assumes two parsing principles:

The parser will build a mother node above a syntactic category as soon as it is present in the input and according to phrase structure rule, which gives us the first parsing principle.

Mother node construction. During parsing, if an MNCC is discovered, then the determined mother node is built above the constructing category immediately and obligatorily.

Constituents immediately dominated by the MNCC either precede or follow the MNCC.

They are attached as soon as possible to the mother node, which gives us the second parsing principle:

IC attachment. Immediate constituents that are discovered before the MNCC for a particular mother node are placed in a look-ahead buffer for non-constructing nodes. As soon as a mother node is constructed, all ICs that can be attached to the mother node in accordance to phrase-structure rules are attached as quickly as possible, either by removal from the buffer or by being encountered later in the parse.

Then Hawkin's Early Immediate Constituents (EIC) principle runs as follows:

Early immediate constituents (EIC): The human parser prefers linear orders that maximize the IC-to-non-IC ratios of constituent recognition domains (CRD).

The constituent recognition domain for a particular mother node construction is according to Kirby (1999: 27) a subset of the words dominated by that category. A more formal definition is the following (Hawkins 1990:229):

The Constituent Recognition Domain for a node X is the ordered set of words in a parse string that must be parsed in order to recognize all immediate constituents (ICs) of X, proceeding from the word that constructs the first IC on the left, to the word that constructs the last IC on the right, and including all intervening words

If we take the four possible VPs containing a verb, an NP, and a PP, we have the following structures:

9)

a) VP[V NP PP[P NP]]

c) VP[PP[NP P] NP V]

b) VP[V NP PP[NP P]]

d) VP[PP[P NP] NP V]

The presented sets of rules describe how VPs attach to PPs. Examples a) and c) are consistent, examples b) and d) are inconsistent. Hawkins (1994) measures the IC-to-word ratio in the following way: The prepositional phrase has 3 words (NP has two words with the determiner). If we count the words till the MNCC of the embedded structure (here, the embedded structure is PP; so the MNCC is P) starting from the

MNCC of the phrase (here a verb phrase) we get in example a) and c) a count of four words. We divide the number of words of the prepositional phrase through this number four and we get an IC-to-word ratio of $\frac{3}{4} = 75\%$. For the inconsistent ones b) and d) we get in the same way an IC-to-word ratio of $\frac{3}{6} = 50\%$.

Hawkins also introduces a supplementary metric, the aggregate left-to-right EIC ratio. This metric gives a higher score to shorter elements that precede longer elements because then ICs will be recognised faster.

According to Kirby (1999: 30), the EIC-principle shows that languages with consistent left-or-right branching “will be more frequent than those that have inconsistent orderings”.

Christiansen and Devlin argue that languages tend to consistencies because of learning facilities. On the basis of experiments with a connectionist learning system, the simple recurrent network (SRN), Christiansen and Devlin (1997) argue that languages with recursive inconsistencies are more difficult to learn and such languages should be less frequent among the languages of the world. Christiansen and Devlin assume that children only have limited memory and perceptual resources available for the acquisition of their native language. Languages avoid recursive inconsistencies, and thus phrases tend to be ‘harmonic’ in the sense that embedded structures follow the same branching as the main structure. So, languages with a mixed recursive set of head-first or head-last rules are more difficult to learn than languages that are either totally head-first or head-last. Such structures are more difficult because they create center-embeddings. Center-embeddings are more “difficult to process because constituents

cannot be completed immediately, forcing the language processor to keep lexical material in memory until it can be discharged” (p. 114). We get center-embeddings when we have a mixed set of head-first and head-last structures in recursive rule sets. Since recursiveness are a central part in our language, such recursive rule sets illustrate well why languages tend to consistencies, especially then if they are likely to occur in recursive rule sets or garden-path-sentences.

A recursive rule set is a pair of rules for which the expansion of one rule involves the second rule and vice versa (Christiansen and Devlin, 1997); e.g... In the following we will take over the examples of Christiansen and Devlin (1997) for illustrating the recursive rule set.

For a head-first structure, we get then the following, as we can see in a):

A -> a (B)

B -> b A

NP -> N (PP)

PP -> P NP

And for a head-last structure, we get then the following, as we can see in b):

A -> (B) a

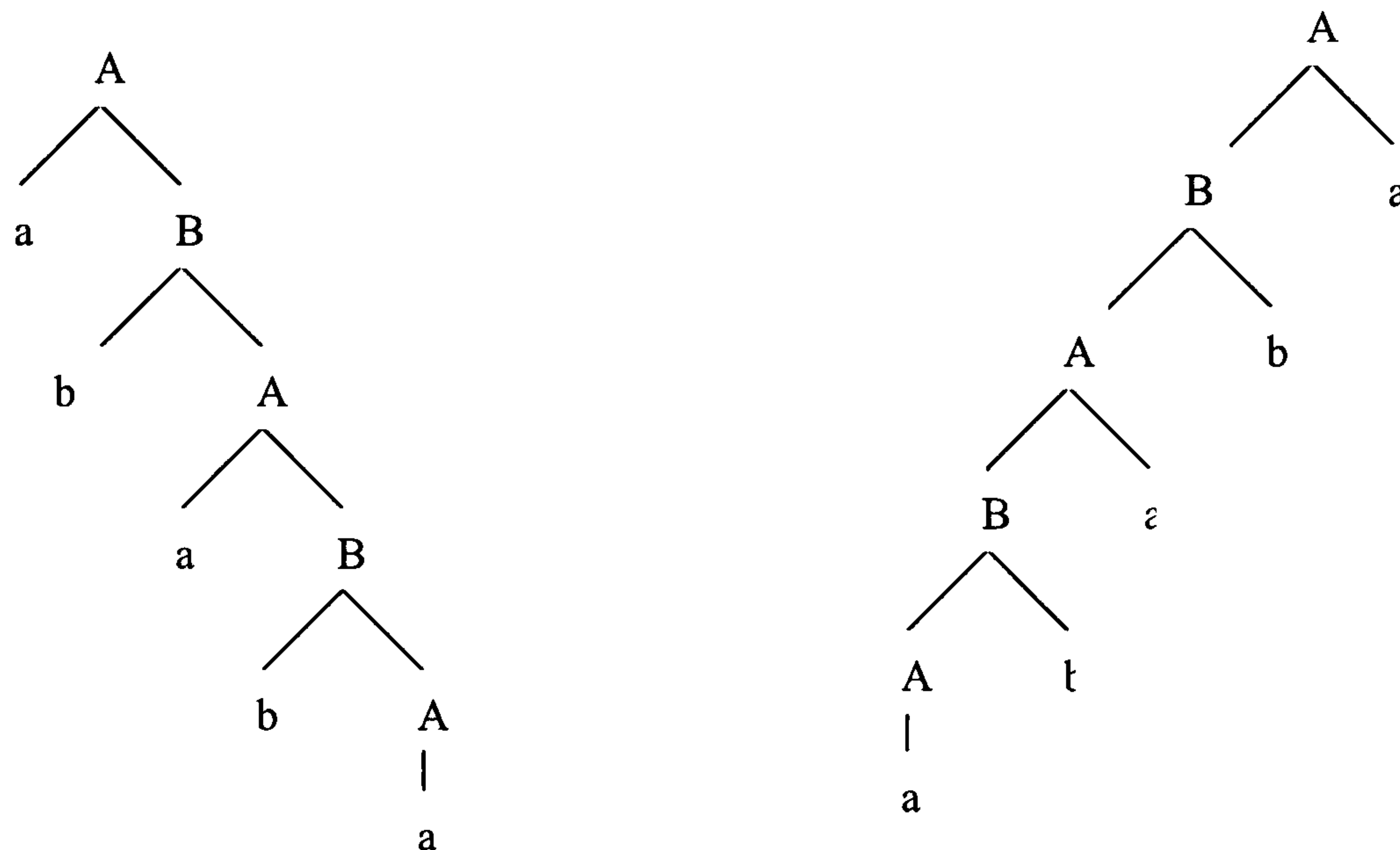
B-> A b

NP -> (PP) N

PP -> NP P

a)

b)



a) [NP buildings [PP from [NP cities [PP with [NP smog]]]]]]

b) [NP[PP[NP[PP[NP smog] with] cities] from] buildings]

A head order inconsistency in a recursive rule set is according to Christiansen (2002, 1997) such as we find them in structures c) and d):

So for structure c):

A -> a (B)

B -> A b

$NP \rightarrow N (PP)$

$PP \rightarrow NP P$

and for structure d):

$A \rightarrow (B) a$

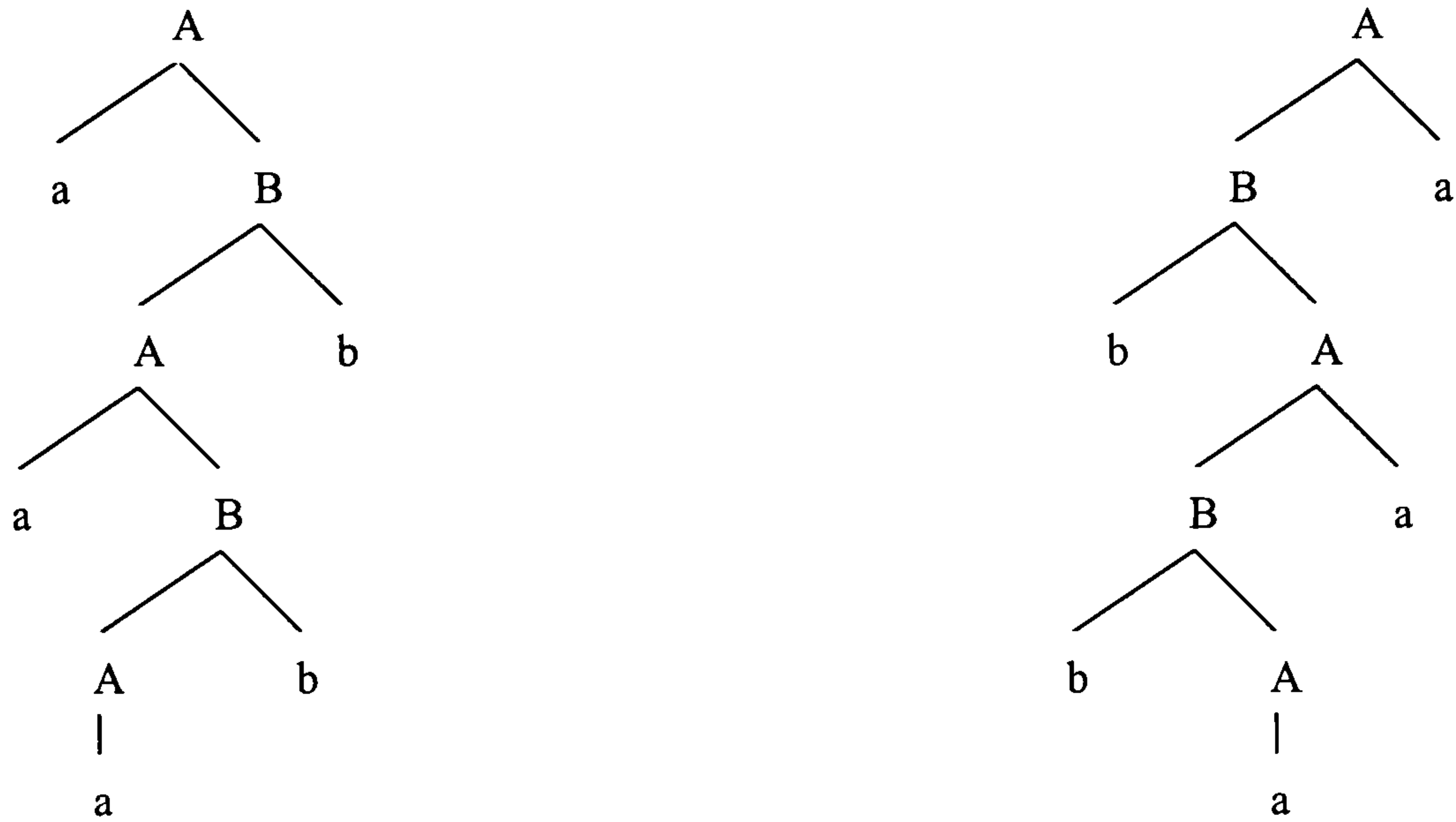
$B \rightarrow b (A)$

$NP \rightarrow (PP) N$

$PP \rightarrow P NP$

c)

d)



c) [NP[PP from [NP [PP with [NP smog]] cities]] buildings]

d) [NP buildings [PP [NP cities [PP [NP smog] with]] from]]

Christiansen and Devlin (1997) say in their introduction that if recursive consistencies are easier to learn (what is the result of their network-simulations), then “recursively inconsistent languages would simply “die out”” (p. 113). Even if inconsistencies are statistically rare in the world’s languages as Christiansen and Devlin (1997) point out there is “a high degree of consistency with respect to the ordering of heads of phrases” (p. 113). But this does not explain why inconsistencies exist in the first place and why such inconsistencies can be quite stable, as we will see.

Furthermore most languages are inconsistent although a few languages like Japanese or Irish are consistent⁸ (Kroch (2000)). According to Comrie (1989), over half of the world’s languages are inconsistent. Persian is according to Comrie (1989), is anotherwise head-first language, but exhibits verb-final structures.

⁸ Kroch gives the following example: “For instance, English is VO and prepositional but has prenominal adjectives and genitives, while classical Latin and Farsi are OV but prepositional. Other languages, like

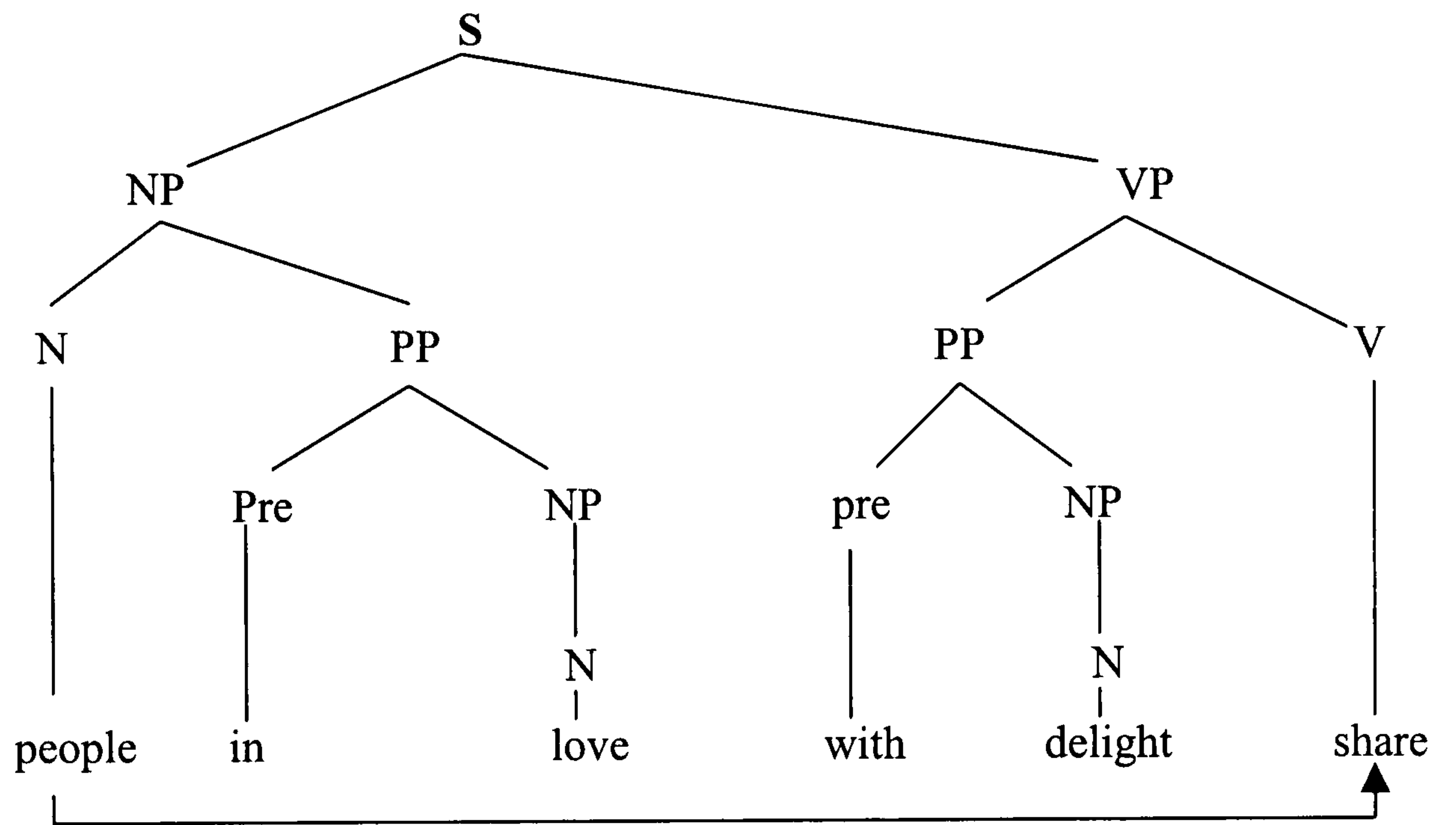
Secondly, it has to be noticed that some structures are more stable concerning the head-ordering principle than other structures. Hawkins (1983) pointed out that “the demonstrative and the numeral are more unstable than the adjective, the adjective is more unstable than the genitive, and the genitive is more unstable than the relative clause”. We have to wonder why some structures are more stable than others and what it depends on. It is unlikely that inconsistencies occur in recursive rule sets such as discussed above. A possible scenario could be that mixed branching does not occur in recursive rule sets.

Christiansen and Devlin (1997) distinguish two kinds of inconsistencies: first the recursive inconsistencies and then inconsistencies where rules do not call each other. Such cases with non-direct rule interaction can according to the authors either impede or facilitate learning. Christiansen and Devlin (1997) illustrate this with three examples that I will reproduce here:

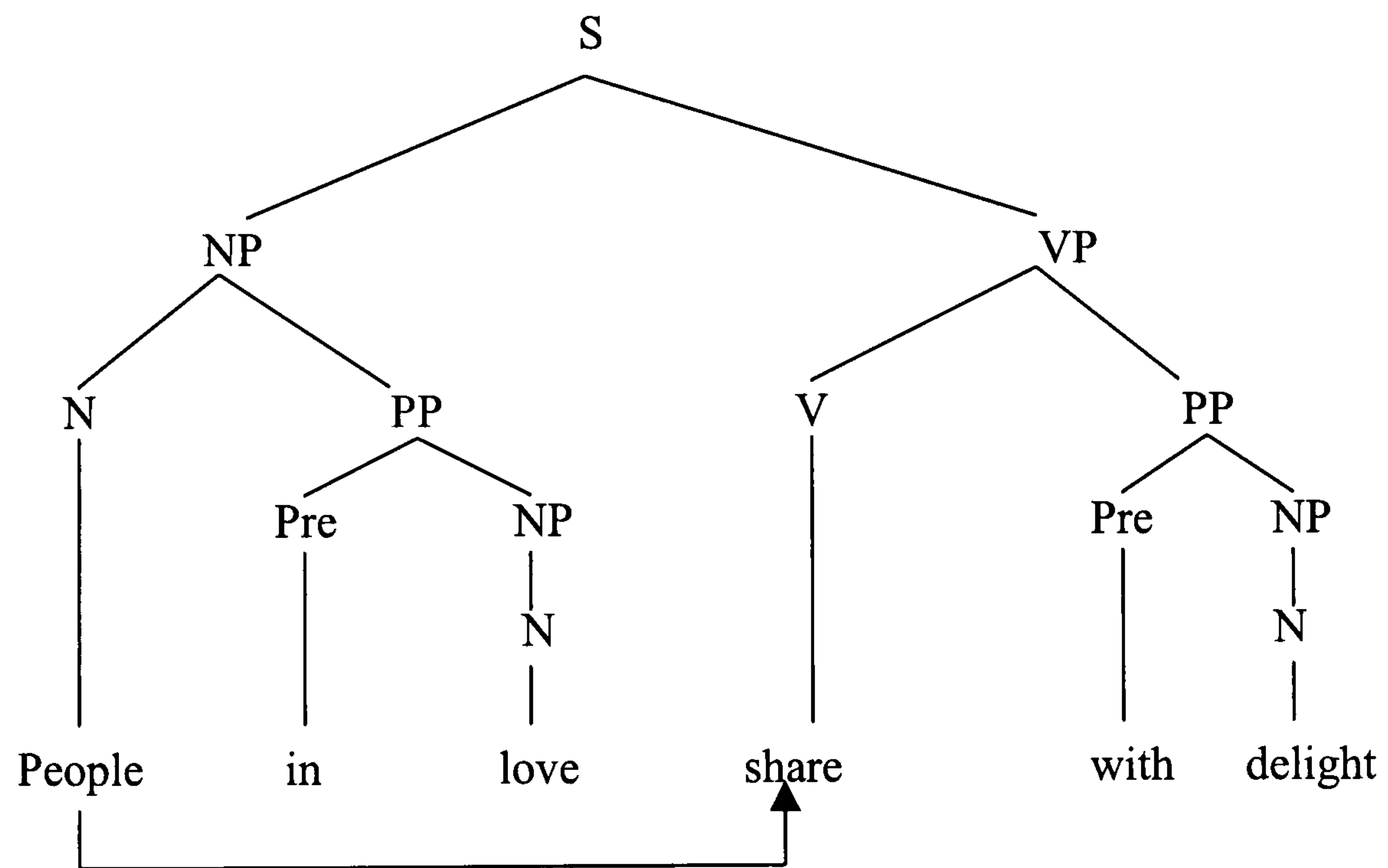
Chinese or Yiddish, show an apparent mix of headedness at the clausal level, so that there is even controversy over whether they are VO or OV”.

10)

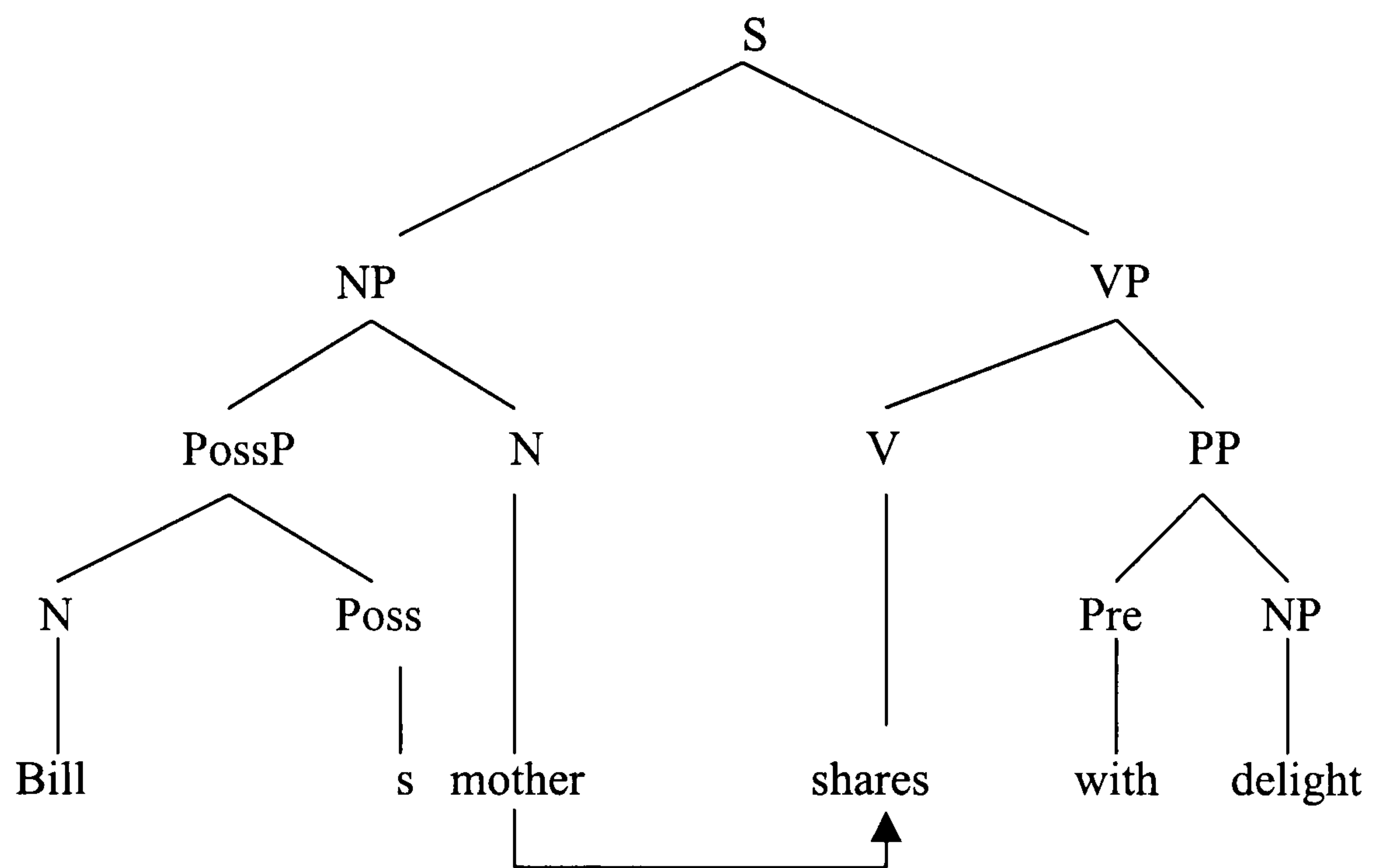
a)



b)



c)



The arrows below the figures indicate the distance of noun-verb agreement. Structure b) is consistent. Structure a) is inconsistent and has longer noun-verb dependencies than b). Christiansen and Devlin (1997) say that “for a system which has to learn subject noun/verb agreement, SOV-like languages with structures such as 3(a) are problematic because dependencies generally will be long (and thus more difficult to learn given memory restrictions)”. Structure c) is after Christiansen and Devlin (1997) inconsistent but has shorter noun-verb dependencies than the consistent structure b). In the following we will see at the example of Romance how languages developed since consistency must be seen as a result of diachronic development.

3.3 Inconsistencies can develop as a result of Language Change

Root clauses and subordinate clauses

Old English used to have an underlying SOV structure and a V2 (verb second) surface structure in root clauses as we find it similarly in German. English developed further on to an SVO language. Old English and other Germanic languages developed from Old Germanic, which used to be an SOV language. Changes start in root sentences like in Old English. And changes later on affect the whole word order of the language. The structure-preserving hypothesis of Edmonds (1976) says that unless they affect root sentences⁹, transformations will preserve the deep structure configuration and only move lexical items from one node to another without changing constituent structure or adding new nodes.

Lightfoot (1981) says that this means “that non-structure-preserving innovations will enter the language first as root transformations, affecting first root sentences, and only later percolating through the grammar to affect the phrase structure rules and thus the structure in embedded clauses. ... Consider, for example, the word order changes, which occurred independently in several of the Indo-European languages like Greek, Romance, Germanic, etc.. SOV-to-SVO change characteristically took place first in main clauses and later in subordinate clauses”

Givón (1976) claims that “main clauses (and in particular declarative-affirmative ones) are the most progressive, innovative environment in language, when innovations are first introduced and from where they spread later on to other environments’. According

to Lightfoot a change, which would first affect relative clauses and then spread to all other clause-types, would be impossible.

After de Rijk (1972), Basque is undergoing a similar change in word order, and again the change affects main clauses first. So in main clauses one finds SOV and SVO orders, but only SOV order in relative clauses, etc.

So, Lightfoot (1981) resumes that “the structure preserving hypothesis yields finer predictions than the traditional account”. It follows from this theory that rules moving major categories would enter the grammar as root transformations, affecting main clauses before subordinates; it does not follow that a morphological change, say, should affect verbs in main clauses before subordinates. In other words, only certain kinds of changes will percolate from main to subordinate clauses. The Penthouse Principle by Andersen (1983) supports the idea that changes first affect root clauses before they do affect subordinate clauses, in saying that “some languages are OV downstairs [in subordinate clauses] and VO upstairs [in main clauses]”.

We have seen that changes start first in root clauses, and only later on can affect subordinate clauses. We also know from acquisition that children also learn structures from unembedded structures (Lightfoot 1997). As we have seen this seems to be the same in language change.

⁹ Root sentences are non embedded sentences such as main clauses, interrogative clauses and affirmative ones.

The linear shift from left to right branching¹⁰ illustrated at the example of Romance.

Introduction

Usually, it is assumed that Indo-European was a consistent language, an assumption that underlies for example the works of Lehmann (1972) and Vennemann (1974). Comrie (1989) criticizes this point of view in saying that “if over half of the languages at present spoken in the world are typologically inconsistent, then, other things being equal, we would actually expect a slightly greater possibility that Proto-Indo-European followed the majority, and was typologically inconsistent”. Comrie (1989) points out that Indo-European was not the starting point and had itself ancestors and was thus subject to a long historical development. As Comrie (1989) points out historical linguists assume that a language is inconsistent because it is in the drift from one type to another. But the conceptual problem is, according to Comrie, that it is not clear why once a language had a consistent equilibrium should change then to another type.

For sure, we cannot find a satisfying answer to this problem, but it is quite clear that Indo-European was mainly a head-last language (Vennemann 1974) and that many European languages developed to head-first languages¹¹. It is difficult to assess what happened before since language data are not available.

¹⁰ Bauer (1995): “The syntactic notion of *branching* accounts for the linear ordering of hierarchically organized elements. Each unity, be it syntactic or morphological, consists of a head which is syntactically the main element, and of a complement that either follows (right branching) or precedes (left branching) the head. In the course of time, one can observe the switch from left-branching to right-branching structures, hence the Latin [[leg] **ibus**] and [[avunculi] **mors**] where the complement precedes the head vs the French [avec[[les lois]]] and [**la mort** [de l’oncle]] where the complement follows its head.

The change in morphology: Synthetic structures become more analytic

According to Bauer (1995a) and earlier Lehmann (1971), there was an overall tendency of Indo-European languages to develop from left-branching structures towards right branching ones. This implies also that synthetic structures, which are left-branching, change into analytic right-branching structures. Left-branching languages, which have head-last structures usually have many case distinctions, which are attached to the root in form of inflections. The word order is more flexible in those languages. Right-branching languages very often only have SVO as a word order, and thus the word order is more rigid. This is because right-branching languages do not have case distinctions. Analytic structures form autonomous words, while synthetic left-branching structures form phrases. Analytic languages contain mostly monomorphemic words and rely heavily on syntax to express meaning, while synthetic languages are inflectional and they rely on morphology. For example, the Latin synthetic form *laudabo* has two equivalents in Modern French, one synthetic one, which is '*je louerai*' and another analytic one, which is '*je vais louer*'. The French synthetic future developed out of a fusion of the verb 'to have' and the infinitive. This is still very visible nowadays if we look at the following paradigm:

¹¹ Consider that the ancient Indo-European languages such as Umbrian, Latin, Sanskrit, Hittite, Ancient Greek etc. were head-last languages. Modern Indo-European languages are often head-first languages

Table: The French future

Avoir 'to have'	Future 'will arrive'
J'ai	J'arriver-ai
Tu as	Tu arriver-as
Il a	Il arriver-a
Nous avons	Nous arriver-ons
Vous avez	Vous arriver-ez
Ils ont	Ils arriver-ont

Table 3.1

The French future is not analytic anymore, and the endings –ai, -as, -a, -ons, -ez, -ont, cannot be seen as autonomous words anymore. Or, to put it in another way, we do not have an infinitive followed by an auxiliary verb anymore. First of all, from a phonetic level, the 'r', which constitutes the border between the two morphemes is pronounced. The final 'r' in an infinitive is not pronounced in French. So, we do not have a phonological boundary between the two morphemes. Second, we can see in the first and second person plural (vous and nous) that we do not have anymore the respective form of *avoir* 'to have'. Most importantly for our purposes, it is not possible to have an auxiliary verb that follows the main verb anymore in Modern French. The auxiliary can only precede the main verb. So we can be quite sure that it is an ending and not an auxiliary verb.

such as the Modern Roman languages.

In English we only have an analytic future form, which is ‘I will praise’. Although there was a trend in Romance towards analytic structures, we see that there are still some synthetic forms such as the future and conditional verb forms e.g. French *je louerai* for the future and *je louerais* for the conditional.

The case of the Future tense: an exceptional retrograde change?

The future form was already on the way of being an analytic structure when a reanalysis took place and another synthetic form took place, which is considered as an exception in the development of Romance. The future form developed from an analytic future form back to a synthetic form. This can be found in Modern Roman languages such as Spanish (see Lyons (1978)), Italian and French. In Latin, the future form was a synthetic structure such as *cantabo* – ‘I shall sing’ as well as the perfect form such as *probavi* – ‘I have tried’. The inflected future form and perfect form were gradually¹² replaced by analytic structures with *habere* (to have). *Probavi* was replaced by *habeo probatum* and *cantabo* was replaced by *habeo cantare*. *Habere* had a meaning of ‘possession’, ‘belonging’ and ‘being in presence of’. In contexts used with a gerundium, it implied obligation and thus some kind of future orientation was involved.

11) Aedem habuit tuendam

House had look:after-Gerundium

(c. 40 BC, Cicero, Ver. II.1,130; cited in Pinkster 1987: 208).

¹² Benveniste (1974) criticizes authors who say that the Latin synthetic form *cantabo* was replaced by an analytic structure *cantare habeo*. Benveniste (1974) points to the fact that both the synthetic and analytic (periphrastic) coexisted and thus must have had different connotations. So, it is more correct to say that

Thus, in Late Latin both the future and the perfect could occur in both positions: OV and VO. So we get according to Hopper and Traugott (1993) the following patterns:

a) *cantare habeo* ~ *habeo cantare* (OV ~ VO)

b) *probatum habeo* ~ *habeo probatum* (OV~VO)

The analytic future form '*cantare habeo*' was then in the following fused into another synthetic structure in French '*J'aimerai*', when the verb 'to have' was in the present tense and when it was in the past tense we had the conditional '*J'aimerais*', which did not exist in Latin. But, we have to see that the analytic structure *amare habeo* was still a left-branching structure exhibiting OV characteristics since the finite verb followed the infinite verb form. So, in French only the still left-branching structure could be turned into a synthetic structure again. This happened for the future and conditional but not for the perfect, so that we can still see a clear tendency of getting more analytic structures when the language develops into a right-branching structure. To the difference of the perfect form, the analytic future form was restricted, according to Benveniste (1974), to subordinate clauses. OV was more predominant in subordinate clauses, which can also explain the development of the French future. In Spanish, according to Lyons (1978), the analytic compound form *cantar he* coexisted with the resynthesized form *cantaré* until the analytic form finally disappeared. In French and Italian, according to Lyons (1978), "the compound form did not survive into the modern language at all; from the first French document, the *Strassburg Oaths*, only the synthetic future occurs (*salvarai, prindrai*)". The development from an analytic structure towards a synthetic structure was only possible because the phonological environment was such that such a

development was favoured (see Lyons, 1977). But, as Lyons (1978) point out, this development from an analytic towards a synthetic structure is an isolated typological change as far as Romance is concerned. Changes from synthetic to analytic structures are characteristic of the evolution of Romance, as they are for the Germanic languages and generally for the development of Indo-European languages.

To summarize, we can say that the Latin synthetic future form, which was replaced by an analytic one, became through fusion synthetic again. This can be considered as a retrograde change since directionality is assumed and the trends towards analyticity continued in Romance. But the fusion occurred still at a time when Romance was still left-branching. Consider also, that in Modern French another analytic future form developed with the verb 'aller' 'to go', which coexists with the synthetic form.

Right-branching in word order – the development from Latin to French

Indo-European is said to be head-last (left-branching). Languages like Latin (Bauer (1995a)) or Proto-Germanic inherited it from Indo-European. The unmarked word order of Indo-European was like in Latin SOV (Watkins, 1964)), while most modern Indo-European languages have an SVO word order. Indo-European like Latin had a so-called free word order¹³. In Latin, for example, verb-initial sentences were stylistically marked and SVO existed but was still uncommon according to Bauer. Bauer says that when

¹³ Bauer: "In contrast to what many linguists traditionally assumed, Latin word order was not indiscriminately free: the elements of each constituent, the head and complement, presented a specific branching pattern in unmarked order. Word order variations did occur, but they were syntactically or stylistically motivated".

Latin's word order is SOV and French word order SVO, then there was a "reorganisation of one structural pattern into another". SOV languages like Indo-European or Latin have postpositions and tend to place objects, adverbs, adpositional groups etc. in front of the verb. SVO languages like French tend to have prepositions and place these elements after the verb. This change was accompanied by a gradual morphological change. Nominal markers were replaced with articles. Verb endings indicating person, number, tense, mood, voice and aspect have been replaced with preposed subject-pronouns and auxiliaries (see for example Bauer, 1993). This change from a synthetic to an analytical language was not only limited to the Romance languages but a general development in Indo-European languages. Bauer (1995a) excludes external factors that might be responsible for these changes in the Roman languages, especially French.

The chicken and egg question, what came first: Did erosion of morphology trigger right-branching or did right-branching result in analytic structures?

The question that arises is what triggered right-branching independently in so many languages although related but geographically so diverse that mutual influences can be excluded in most cases. In philology and historical linguistics of the 19th century, it was assumed that the disappearance of cases was responsible for such changes in word order. It was claimed that the impoverishment of the case system was due to phonetic erosion. The disappearance of the case system was made responsible for the emergence of fixed word order. Bauer (1995a) critiques this view in saying that it takes only changes in nominal inflections into account. Bichakjian (1987) argues that structural changes occur independently of morphological erosion, and that they are not caused by

this process. There are Indo-European and non-Indo-European languages that “have developed an SVO order while having quite clear case markers” (Bichakjian 1987). Koch (1974) and Miller (1975) have shown that in Indo-European SVO order chronologically precedes the loss of cases. Also according to Bourciez (1956:13), the disappearance of case endings was triggered by the reorganisation of word order in Latin. After such a structural reorganisation, case endings are redundant and thus not needed anymore and they tend to decrease gradually. Bauer (1995a) says that “the change in morphology was too late to be the triggering mechanism of the tendency toward right-branching”. According to Bauer (1995a), this “shift toward analyticity is the effect of the tendency toward right-branching, not its cause, hence a secondary effect”. According to Bichakjian (1991), the change from left-branching to right-branching is some kind of general shift since it was observed in many different language groups such as Semitic, Caucasian, Uralic, Dravidian, and Altaic languages. For him, “it is apparent that the ancestral grammatical structures were left-branching, and, wherever evolution took place or was in the process of doing so, the general shift was from left to right branching, and never the reverse”.

According to Bauer (1995a), in Roman languages “the principal change in morphology was not the tendency toward analytic forms, but the reversal of the order of the elements: the archaic forms, in which the endings followed the stem, have been replaced by structures in which the grammatical element precedes the lexical element”. Bauer assumes that the morphological ending is a syntactic head. So, if noun inflection is reorganised into determiners the head changes in the sense that the inflection, which is head-last, will be reorganised into determiners, which are fronted and then head-first. In Latin inflection that followed the noun functioned as determiners and possessives. The Latin demonstratives developed into articles in French and dependency was expressed

by determiners then on. The same is true for all other morphology. In French, one would express the comparative by a marker, which precedes the adjective, e.g **plus** grand, which is the analytic structure, while Latin had the synthetic form **maior**. So, the head of the comparative would be last in Latin, while it is first in French. English for example has a mixed system for comparatives, where we have the synthetic form 'bigger', but also the analytic form 'more beautiful'. Another grammatical element that precedes the lexical element that developed in Indo-European languages such as Greek, Albanian, Italic-Romance, Celtic, Baltic, Slavic as well as Germanic, so Lehmann (1971), are prefixes, which were absent in Proto-Indo-European. The argument for morphological inflections being heads is according to Bichkjian (1986) that "the preposition is the head of a prepositional phrase, then the degree adverb and the case markers must be the head of a comparative adjective and of an inflected noun, respectively". If we consider that in analytic languages the determiner is considered to be the head according to modern linguistic theories (Chomsky 1986b), it makes sense to consider that in a synthetic head-last language noun-inflections are the heads. Also Hawkins and Gilligan (1988) argue that morphological endings are heads.

The change from left-branching to right-branching seems to be gradual and slow and some syntactic structures go through this change earlier than others. The prepositional phrase, the particle comparative construction and the right-branching relative clause (NR-Relative clause follows noun) are early developments that took place before Latin. Other structures changed later on. The Genitive became postposed in the period from Old Latin to Classical Latin (Thus NG -> head, which is the noun, is first), and the preposed determiner appeared after the classical Latin period in Late Latin and Vulgar Latin. In the following, we will outline some changes that took place in syntax with an emphasis on the diachronic development from Latin to French. Bauer (1995a) argues

that data are rich enough and well documented to say what really matters, while Lehman (1970) claimed earlier that our documentation for Latin and the early Romance languages is too scarce to explain the change from postpositions to prepositions or other phenomena. Of course, data are not as rich as in Modern Languages, but Roman languages, especially Latin, are the best documented languages of the past.

In the following we will give an overview of changes in head-ordering of phrases how they occurred in time. We will see that adpositional phrases, genitive phrases and noun phrases changed much earlier than verb phrases. Interestingly, as we will see in the next chapter, we find something very similar in German. The noun phrase is basically head-first, thus right-branching, while the verb phrase is head-last. This could suggest that changes in the noun phrase can occur independently from changes in the verb phrase.

Changes in Adpositional Phrases

Adpositions changed quite early from postpositions into prepositions. According to Bauer (1995a), the adposition underwent this change to right-branching much earlier than verbs did. Archaic Indo-European languages had predominantly postpositions. In Sanskrit postposing was the rule (Brugman 1922, p. 461). Hittite had postpositions but no prepositions (Friedrich, 1974, p. 129). In Italic languages like Umbrian and Oscan adpositions started to change. In Umbrian and Oscan, we still find dominantly postpositions but already some prepositions, which indicates that a change might take place. Already in Latin we normally find prepositions, but there are still examples of postposing. But their number was limited and the context in which they occurred. So, the preposition underwent this change like the adjective and the genitive long before the shift occurred in VPs.

Lockwood (1968) gives an example how such a preposition developed into Latin. The particle 'ad' was reanalysed into a preposition and an inseparable preverb depending on the position of this particle in the phrase:

In the sentence *Capuam veni* 'I came to Capua', the verb regularly governs the accusative in accordance with ancient Indo-European practice, the case expressing motion towards. Into such a sentence it was naturally possible to introduce the adverb *ad*, which in Italic indicated motion towards; this reinforced the concept already stated baldly in *Capuam veni*. If used in particularly intimate connection with the verb, the sentence ran *Capuam adveni*; if used to emphasize the noun *ad Capuam veni*. In the former position, the adverb became an (inseparable) preverb; in the latter position, it became closely linked with the noun and so turned into a preposition governing the accusative. Furthermore, it is likely that *ad* could be used redundantly in our sentence as well: *ad Capuam adveni*; at any rate, the construction is amply attested, e.g. *se ad philosophiam adplicare* 'to apply oneself to philosophy'. In the present case, these secondary developments were accompanied by a decline in the use of *ad* as an independent adverb.

Something very similar happened in Old German (Lockwood 1968), where the adverb of place gave birth to prepositions and preverbs in compound verbs.

This also might explain why prepositions developed early in Latin since particles that followed the noun and thus preceded the verb were rather analysed as preverbs and not as postpositions. Since the noun phrase was reanalysed earlier into a right-branching structures, a reanalysis into postpositions was perhaps not possible.

Change in the Genitive

The genitive is another structure along the adposition that changed quite early. According to Delbrück (1900), the genitive precedes the noun in Proto-Indo-European, which means that the structure was left-branching. We find such structures in languages

as Sanskrit, Archaic Greek, Hittite and Italic languages. In Oscan and Umbrian, which are Italic languages that coexisted with Latin, the genitive generally preceded the noun. But already so early postposing of genitives occurred. This was indeed a marked stylistic usage at this time. Konneker (1975) stated that there was a clear preference for the preposed genitive in Oscan. According to Konneker (1975), the examples of postposing the genitive all occurred in inscriptions later than 200 B. C.. In earlier texts all genitives precede the noun (Konneker, 1975). Bauer (1995a) says that right-branching is not excluded in Oscan and Umbrian, but it is rare and stylistically marked. In Old Latin, the change of the genitive via right-branching is already manifest, but nevertheless rare (Bauer, 1995a). The unmarked position of the genitive, so Bauer (1995a), is preposed:

16) *Senatuos sententiad*

Senate-Gen. decision-Abl.

‘with the decision of the senate’

(Bauer 1995a)

The genitive changes significantly from the Old Latin period to the Classical Latin period. Adams (1977) offers quantitative data of the genitive in Classical Latin. He shows that the left-branching genitive is not anymore unmarked since Plautuson. According to Adams (1977), the right-branching structure ‘Noun-Genitive’ is then the unmarked order in Classical Latin. The coexisting of two genitives is a principle that can still be observed in Modern English and German, where after the unmarked RB genitive, a marked left-branching coexists, as we will see later on more deeply.

In Vulgar Latin and Late Latin, this tendency towards placing the genitive after the noun increased still further on. In Old French the postposed genitive was a structure without preposition like:

17) La fille le roi - 'the king's daughter'

Gradually this structure without preposition developed into a prepositional phrase. So, in Old French, the genitive directly followed the head noun (Foulet (1923)). According to Bauer (1995a), there are only a few examples in Old French of left-branching genitives of the type *pro deo amor et pro christian poblo* (Serments de Strasbourg I) 'for God's love and for the Christian people' or *li Deo inimi* 'the enemies of God'. These archaic structures are fixed expressions that survived till the 13th century.

In the 14th and 15th century, genitives are only prepositional phrases in French as it is the case in Modern Roman languages. There are only a few exceptions of genitives without prepositions that survived in fixed expressions as in *l'hôtel-Dieu* 'hospital'. We can summarize that the left-branching genitive of Old Latin changed towards a right-branching one in French. We had a development of a left-branching genitive phrase in Old Latin as in the example we have seen before:

18) Senatuos sententiad

Senate-gen. decision-Abl.

'with the decision of the senate'

The head noun is last, and the genitive is marked as an inflection, thus last. In the following the order is reversed into 'Noun-Genitive', and the genitive marker will be preposed. In Modern French, this genitive marker is a preposition.

19) La fille du roi

The daughter of the king

'the king's daughter

Changes in the Verb-phrase

According to Watkins (1964), the unmarked order of Indo-European is (S)OV. The marked order of Proto-Indo-European was verb-initial. In left-branching languages, the relative clause precedes the noun (so the noun is last and must be considered as a head), while in right-branching languages the relative clause follows the noun. The right-branching relative clause, the fact, that it follows the noun, is an early creation in the history of Indo-European and is one of the first steps towards right-branching. Another right-branching element that was introduced was the conjunction, which is the marker of the subordinate clause.

According to Bauer (1995a), Latin reflected the ancient structure of the proto-language in the sense that verb-final was the unmarked order and that verb-initial was marked. But Latin already introduced the first right-branching element, which is the medial verb. The medial verb was in contrast to the verb in initial position unmarked. Prepositional phrases are the most frequent element that follows the medial verb followed by direct objects (Linde, 1923)).

In Old Latin texts, according to Bauer (1995a), the auxiliary usually follows its complement in final position of the clause. There is a tendency in the Romance history of right-branching this element, i.e. to prepose the auxiliary. Since the auxiliary is “an inflected element, it carries, the personal marker and thus expresses subject agreement. As such the auxiliary is the head of the compound form” (Bauer, 1995a).

Bauer (1995a) states that “it turns out that the tendency towards left-branching is stronger in the subordinate clause than in the main clause”. This is a general tendency that can also be observed in Umbrian, in Latin, in Medieval French and many other languages.

Adams (1977) examined the writings of Plautus, who was known for his popular everyday language. What is striking in these writings is that left-branching verb phrases contrast with right-branching tendencies in the NP: the genitive and the adjective follow the head. According to Bauer (1995a), right-branching noun phrases confronted with left-branching verb phrases are observable in all Italic languages in all periods. Generally it can be said that right-branching occurred in the VP much later than in the NP in Latin and French (Bauer, 1995a). If we compare this with Modern German (or Dutch and Flemish), we can see that the noun phrase is usually right-branching and the verb phrase left-branching. The divergence of branching in noun and verb phrases does not mean that the language would have recursive inconsistencies since these occur inside a noun and verb phrase. So from this point of view, it is not surprising that such a development is possible if we consider that irrecursive consistencies would be very unlikely. The disadvantage of such a syntax is that it creates long-distance dependencies, i.e. the distance between the subject noun and its governed verb, since the head-noun stands in front of its complement and the verb is likely to be in sentence-final

position (since the verb phrase is left-branching). This ‘disadvantage’ might be then the reason why the Romance languages’ verb phrases became right-branched.

Verb position in Vulgar Latin and Late Latin

According to Bauer (1995a), the frequency of the medial verb increased in Late Latin and Vulgar Latin. The verb system tends to be right-branching now, so the infinitive normally follows the finite verb, except when combined with *do* and *habeo*.

The unmarked final verb position lost its predominance. The verb in final position survived longest in subordinate clauses.

Verb position in Old French and Middle French

The tendency of SVO becomes stronger. SVO is already quite common in Old French, but we still find SOV-structures, especially in subordinate clauses. According to Bazin-Tacchella (2001), Old French has to be situated between Latin, which is a predominant SOV-language and French which is a basic (X)SVO-language.

In Middle French SVO became the established order. SOV was already very uncommon in Middle French and only occurs in subordinate clauses, where it coexists with SVO. Since the case system was defective, according to Bauer (1995a), SOV only occurs when no ambiguities arise, i.e. when there was not a succession of 2 nouns. So, SVO became the established order in Middle French.

In Romance, the left-branching inflected verb form was replaced by a preposed auxiliary. But the change from synthetic to analytic does not seem to be complete in

French, since we still find synthetic structures in the French future and conditional forms ('future' and 'conditionnel') such as 'j'arriverai' and 'j'arriverais', although the French verb system is a total SVO-system.

Subordinate clauses are more resistant to the right-branching change than main clauses in Latin and French. So, in Old French final verbs are more frequent in subordinate clauses than in main clauses.

Latin also exhibited a verb-second phenomenon. In Latin the verb was preposed when the main clause was preceded by a subordinate clause, an ablative absolute, an adverb or an adverbial phrase in initial position (Möbitz (1924)). Bauer (1995a) claims that the frequency of V2 varies and that it increases significantly in later texts. There is according to her a syntactic motivation of verb second and it "accompanies Latin's gradual shift from left to right branching". In Old French, verb second does not appear anymore after subordinate clauses but after adverbs and more rarely after direct objects. In the 13th century, a preposed direct object did not trigger automatically V2 anymore. V2 becomes more and more rare till it disappears. According to Bauer (1995a), it is not quite clear why V2 disappeared in French since it survived in German.

3.4 Remaining Left-branching structures in German and Dutch

But, we still find in modern Roman and Germanic languages structures that did not undergo this change. Although we find in all Roman and Germanic languages prepositions (there are only a few postpositions in German, 0.43% of all adpositions in German are postpositions according to the Cosmas Corpus¹⁴), we find in German a

¹⁴ Cosmas Corpus II, Morphological and syntactic annotated corpora, Institut für deutsche Sprache, Mannheim

verb-final structure, although verb forms are analytic, i.e. that auxiliary verbs are autonomous words and not attached to the lexical verb as some kind of inflection. So, in German we find the finite verb in sentence-final position in subordinate clauses and infinite verbs are in sentence-final position in root clauses. So, the verb is said to be head-final in German and V2 is explained through verb-movement to the complementiser. But German has also a lot of features of a head-first language. German's noun phrases are usually right-branching, as it is the case for English. Such structures are bad for long-distance dependencies. But despite such inconsistencies German does not move to a total SVO language with pure head-first structures. Prepositions tend to change quite early and already postpositions are quite rare in Old Germanic languages as Old German and Old English. VPs change quite late. They did change in languages like English or the Roman languages. But we still find OV structures in German and Dutch. We might say that German is stable in the sense that OV seems to survive. If we consider other Germanic languages such as Swedish (Delsing 2000), Yiddish (Santorini 1993) and English (Pintzuk 1995) who lost OV already centuries ago, and the loss was relatively rapid. Since these structures are stable in German and Dutch, but only limited to certain contexts (Subordinate Clauses, infinite verb forms), something must tell children that Dutch/German has verb-final structures. In evolution, something must have happened that German/Dutch stopped evolving towards a total head-first language. One might say that the English and the Roman languages evolved further and German/Dutch stopped this development on the track. These languages must have evolved toward an equilibrium, which makes sense and something must be profitable enough to compensate the disadvantages of inconsistencies (like prepositions with an OV-structure). If this would not be the case the next generation of children acquiring this language would reorganise the language in

the most economic way and they would get rid of such inconsistencies as discussed in the introduction. Syntactic changes are relatively rapid and it would be unlikely that a language, with inconsistencies that make language learning tremendously more difficult, would not be reorganised by learners at some point. Since this does not happen, German and Dutch must be optimal in a cognitive way. In Roman languages like French we still find SOV in structures with clitic pronouns. We do not find this in German or Dutch. So it might be that languages develop towards different optima. Kroch (2000) discusses the question of stability and notices while some languages change rapidly as it is the case for the syntax in English some languages stay stable for centuries as it is the case for Japanese's syntax. Kroch (2000) uses the argument of stability of many languages for claiming that language learning is not as imperfect as often assumed. In general, we cannot say that a language, which has stayed stable for several centuries, is inconsistent in such a way that it is under pressure to change or that the input is so messy that children will have to reorganise it to a more consistent type.

If we assume that we find stages in language evolution¹⁵ as we find it in language acquisition, we might wonder why we find an SOV-structure with clitic pronouns in Roman languages but not in German or Dutch where we find head-final VPs. Clitic pronouns are fast analysed as belonging to the VP, and since they are short, the evolution is different, so we still find here an SOV-structure because:

¹⁵ The stages of acquisition and evolution might be different than as it might be assumed in the terms of Haeckel (1866). He believed that the ontogenesis is a brief and rapid recapitulation of phylogenesis, determined by the physiological functions of heredity (generation) and adaptation (maintenance). This means that the development of the individual embryo repeats as alleged evolutionary history. Some linguists assumed in the 19th century that this might be the same for language structures. That the ontogenesis of the language (the learning of the language by the child) is quite different from the evolution of the language is quite different is fast recognised if we consider that Latin was a left-branching structure and French a right-branching-structure. A child who learns French does not have to recapitulate all the stages of the passage from left to right-branching. The child would never learn such left-branching structures as possible in Latin. There might be some stages in language evolution, which are not dropped, if a language for example passes from left to right branching (the other way round is rather unusual).

So, the stages in language acquisition and evolution are of a different nature.

Clitic pronouns fit into the new structure and are not analysed as a left-branching structure anymore. The clitic is attached to the verb and it is analysed as a VO-structure.

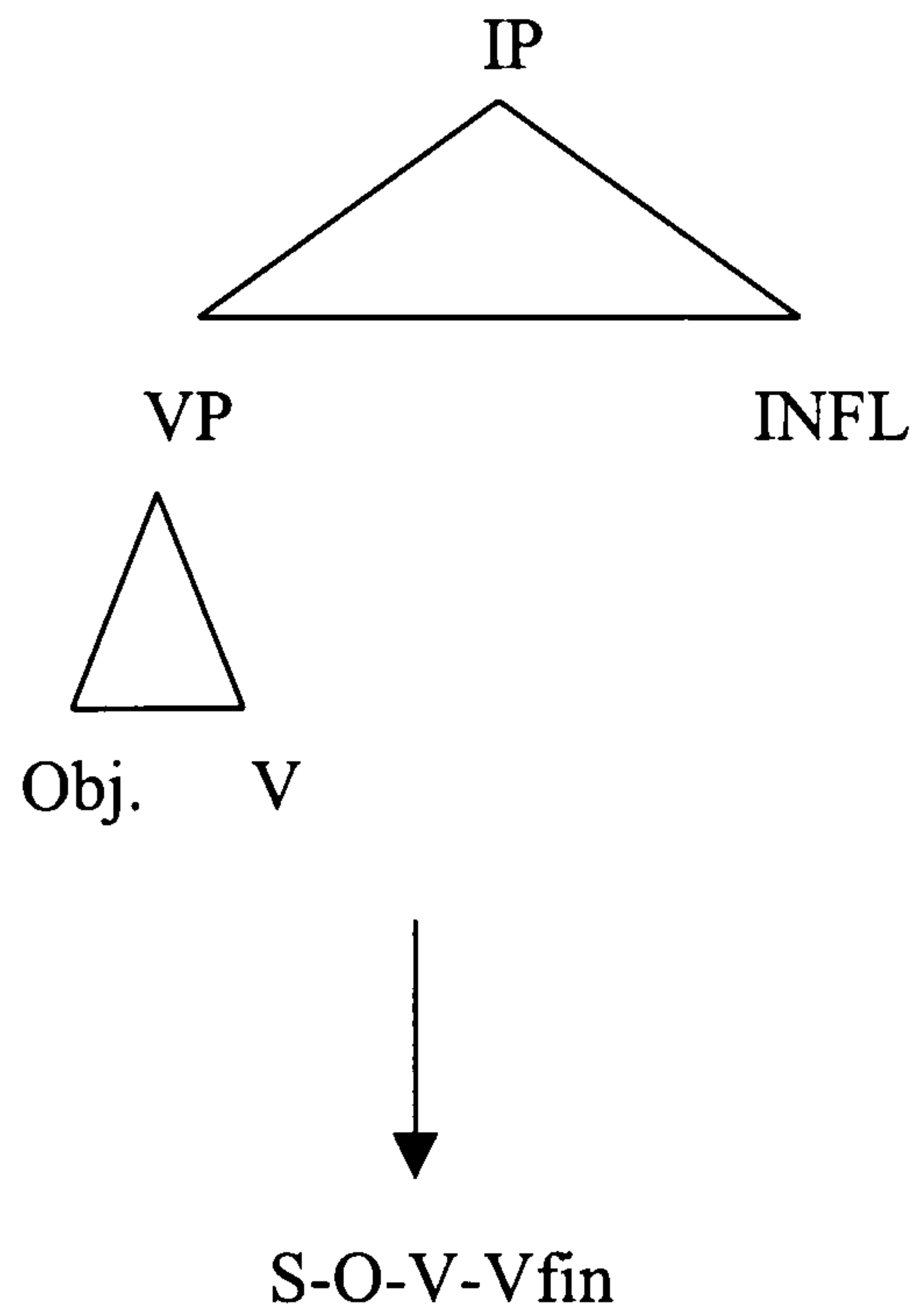
3.5. Possible origin for right-branching

Coming to the question why Indo-European languages had a tendency towards right-branching and what triggered it, we have to consider that Indo-European was a head final language. Verb-final languages almost always have case systems (Greenberg 1963: Universal 41) and so different possible word orders. The same was the case for Indo-European. Let us consider the different possibilities if we assume that a language has finite and infinite verbs:

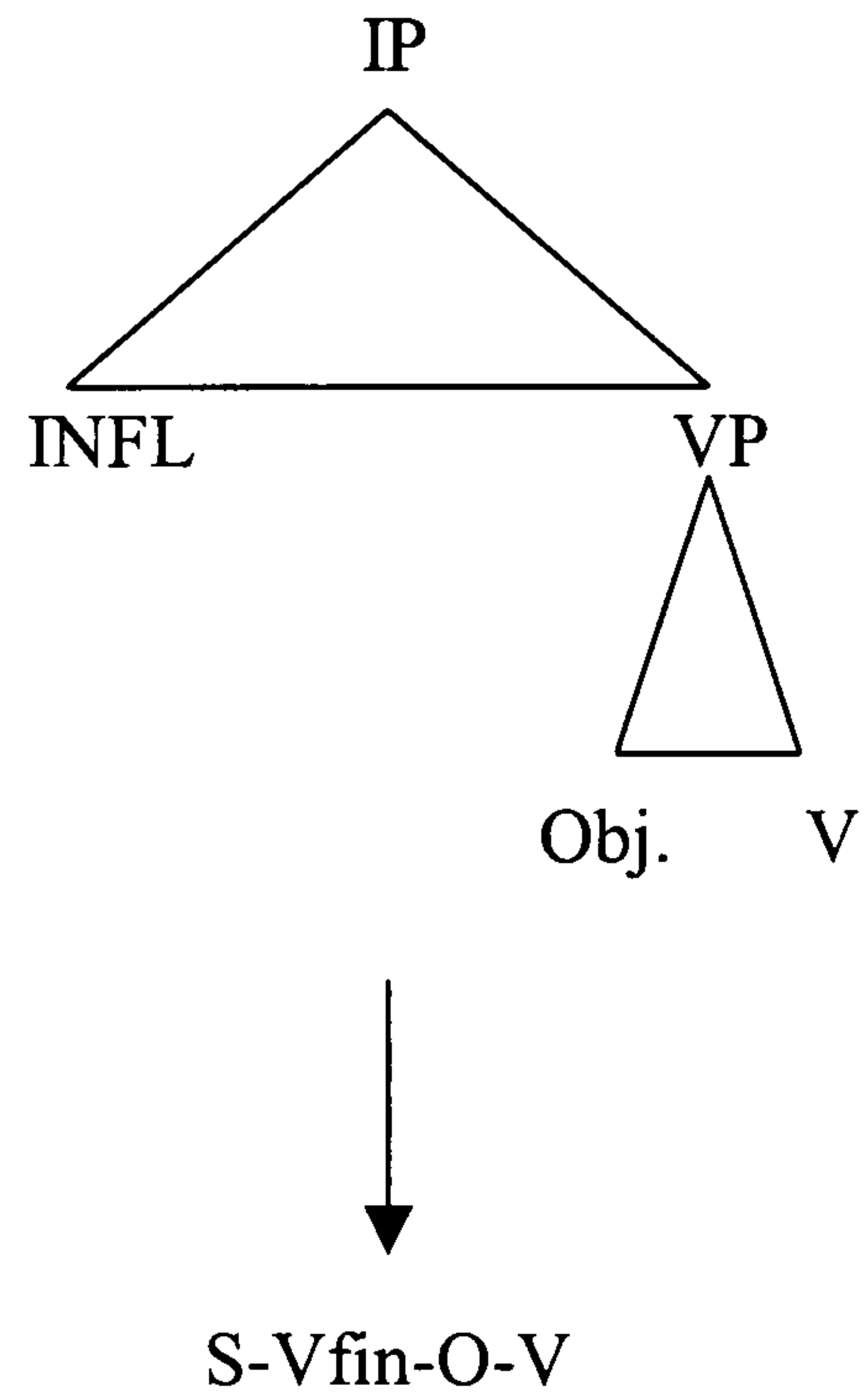
If we observe the following structures we can observe a sequence from left-branching towards right-branching from 20 a) to c)

20)

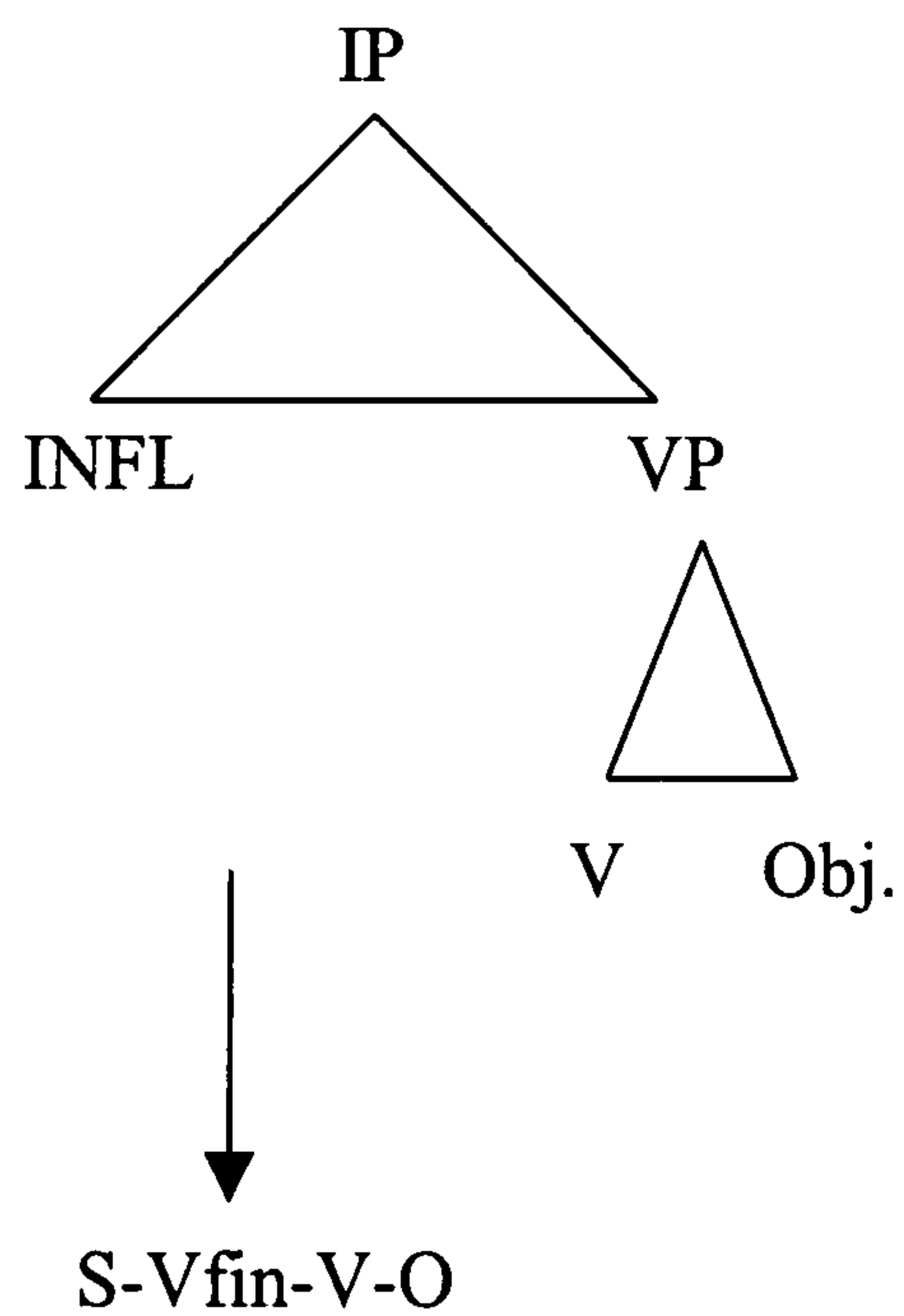
a)



b)



c)



Structure a) is a consistent head-last structure. INFL, which holds the finite verb, is the head of the IP, and thus head-last. The VP, which is the complement, is head-last as well, thus V, the infinite verb appears in final position. In structure b), INFL, the head

of the IP, is head-first, while the VP is still head-last. In c), both IP and VP are head-first.

Since the basic word order of a head-last language is structure a) and is left-branched, other word orders that can appear in such a language must be more right-branched since a further left-branching is not possible. So, we can have for example structure b) as in the example for Germanic languages. If we have an SOV language with different word orders, postpositions are quite consistent with the basic word order, but since other word orders are parsed (for example SVO, OVS, VSO), we have more right-branched structures and postpositions turn out to be inconsistent (Christiansen and Devlin, 1997) and to be more difficult to parse because of centre-embeddings. So, postpositions gradually start to turn into prepositions if more and more right-branched structures are parsed. The more right-branched structures are parsed, the more likely the language will undergo further right-branching. In German as we have seen, we find dominantly prepositions, although German has an SOV basic-structure. But since more right branched structures are parsed and SOV is only found in subordinate clauses (for about 24%, childes corpus for Dutch 2% (Wijnen 1995)) prepositions are more consistent with most language data in German and Dutch. The infinite verb is always in last position in the VP in Dutch and German and so head-final turns out to be stable in German and Dutch. The existence of a case system might be only a partial and unsatisfying answer since we do not find an elaborated case system in Dutch as in German. The question finally is why German does not undergo this right-branching from structure b) to c). The answer must be that there is a kind of equilibrium.

3.6. Right-branching in Germanic

As we have seen before for Romance, in Germanic, too, there is a tendency from left-branching towards right-branching, which is accompanied by a reorganization from synthetic structures towards analytic structures in morphology, which was already accounted by Jespersen (1922). Old High German does not have any personal pronouns and express these relations by verb-endings (inflections). Proto-Germanic lacked articles like Proto-Indo-European did. German like English has developed a definite article from what was originally a demonstrative pronoun (the same happened in Latin) and an indefinite article from the numeral 'one'. Old High German exhibited synthetic verb forms, where relations were expressed by inflections, and thus did not have composed tenses as present perfect or past perfect, and the future which is expressed by the verb '*werden*' in Modern German was expressed by the present tense. Prepositions were created and replaced case markings. In Old High German adpositions rarely occur after nouns and adjectives, instead case markings had been employed. The oblique case-forms of the nouns have also in time ceded to a more analytic structures with prepositions (Wells (1985)). According to Wells (1985), the "instrumental case form has been entirely replaced in the recorded history of German: it was dying out in OHG texts, and the archaic Hildebrandslied shows it already linked with prepositions (...)" More recently, the gen.-case form has disappeared in dialects and colloquial German". We have seen here that right-branching tendencies as discussed for Romance, applies also for the case of Germanic.

Conclusion

We have seen in this chapter discussed from the example of Romance with special emphasis on the language change from Latin to French that right-branching is a reorganisation of structures, which as argued by Bauer (1995a), is independent of morphological erosion. The process of right-branching takes hundred of years, and not all structures, as we have seen are affected at the same time. This means that inconsistencies can be seen throughout these periods. We have also seen that morphological changes like the change from synthetic towards analytic structures are part of the process of right-branching. Thus, the reorganisation of word order patterns is not a consequence of erosion of morphology, but the loss of morphology is a consequence of the process of right-branching. We have seen that right-branching occurred in a lot of language families, and is not a particular development of the Roman and Germanic languages.

Chapter 4

The Noun phrase in Germanic

Introduction

In this chapter, we will discuss first the German noun phrase. German has a mixture of head-first and head-last and we will discuss the question if German has to be considered as a basic VO or OV-language. We will see that German's noun phrases are basically head-first, while the verb phrase is head-last.

In the following, we will then discuss from the example of the Genitive phrase in Germanic with special focus on English, how the Genitive phrases developed diachronically from a head-last type towards a head-first type. We will also see that remaining ancient structures (the Saxon Genitive) do not have to be seen necessarily as inconsistencies, but are analysed in a different way in the modern language.

After having discussed the diachronic development of Roman noun phrases in chapter III and some examples of the Germanic noun phrases in this chapter, we will look at recursive inconsistencies.

4.1 German Noun Phrases and consistency

In the following, we will question which is the basic word order of German noun phrases. German seems to have structures that fit rather with an OV-analysis and others which rather go together with a VO-analysis.

German is a verb-final language. Verb-final languages as we have seen before are expected to have postpositions. German is a predominantly prepositional language, with only minor postpositions, which frequency declines in time (see chapter V). German has two genitive structures: Gen N such as in 'Vaters Wagen' (Father's car), and a N Gen structure such as 'das Wunder des Lebens' (the miracle of life).

English, which is an SVO-language and does not exhibit verb-final structures also has mainly prepositions (with a few exceptions such as 'two years ago'), two genitive structures: Gen N such as in 'father's car' and a N Gen-structure such as in 'the miracle of life', which is expressed through a prepositional phrase. Let us consider that both English and German, although they have different verb positions have very similar noun phrase structures. Both languages exhibit patterns such as 'Adj + N', 'Dem + N' and 'Number + Noun', which are probably not very importing for the branching direction (Dryer 1992). Recursive rule sets such as NP PP and N Gen are right-branching in German and English. Since English and German have the same right-branching tendencies in the noun phrase, it cannot depend on the verb positioning, since the verb-positioning is basically different in the two languages.

According to Vennemann (1974), English has still some minor OV-features, i.e. Gen N, and according to him also 'Adj + N', 'Dem+N' and 'Number+Noun' are OV-features. Since English used to be an OV-language, it is, according to Vennemann (1974), still in the process of bringing its constructions into harmony as a proper VO-language and he considers then these structures as inconsistencies. As we have seen, Dryer (1992) showed that these are not branching-dependent structures, so the only structure that breaches then English right-branching tendency is the Gen-N phrase. In the following,

we then try to outsketch the development of the Genitive phrase in Germanic, especially English for further understanding the apparent inconsistent genitive structure in English.

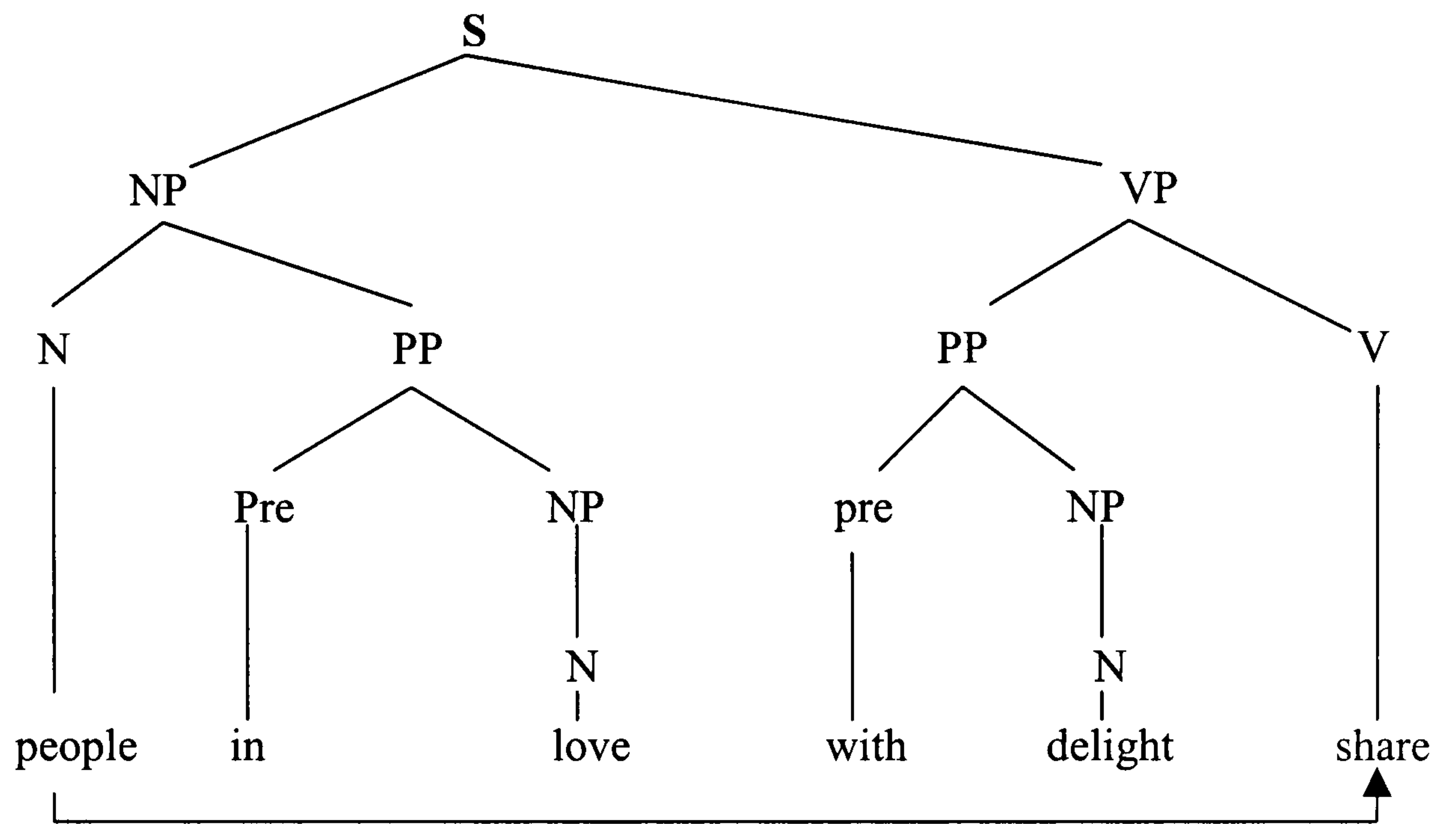
4.2. The diachronic change of the Genitive phrase in Germanic

Christiansen and Devlin (1997) examine the learnability of phrase structures by implementing recursive rules sets in a simple recurrent network. They show in their paper that recursive inconsistencies are difficult to learn by the SRN. They also discuss inconsistencies, which this time are not recursively inconsistent, but inconsistent on a sentence-level, such as head-first noun phrase with head-left verb phrase. These inconsistencies alter the distance between the respective subject noun and the verb that has to agree on the subject noun. Or to put it in another way the number of words between the subject and its governed verb differs. A person has to keep the relevant person (1st person, 2nd person, etc.) in mind till the governed verb, which agrees with the subject comes along. A shorter distance between subject and its governed verb is thus preferable.

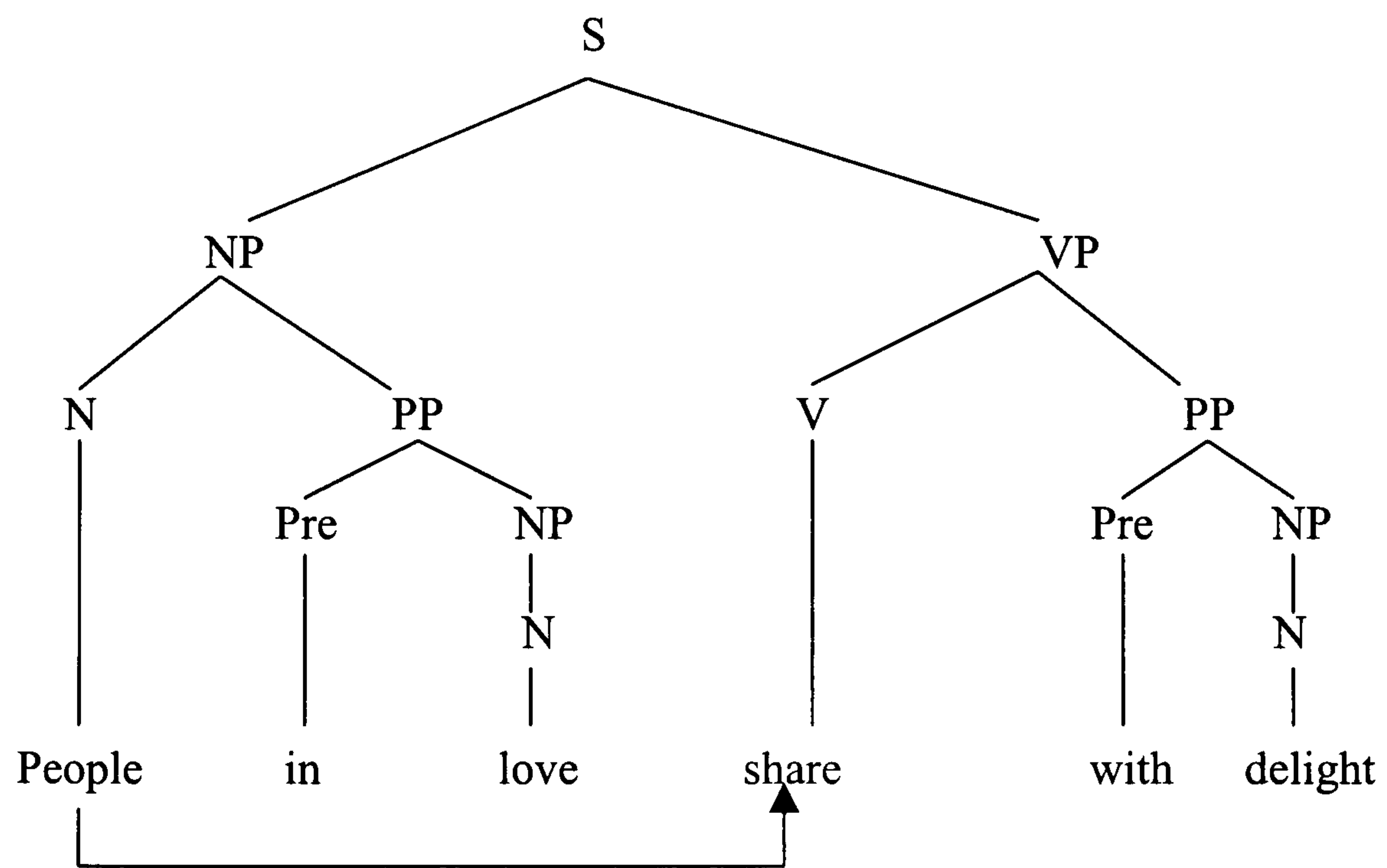
Let us reconsider the examples discussed above by Christiansen:

21)

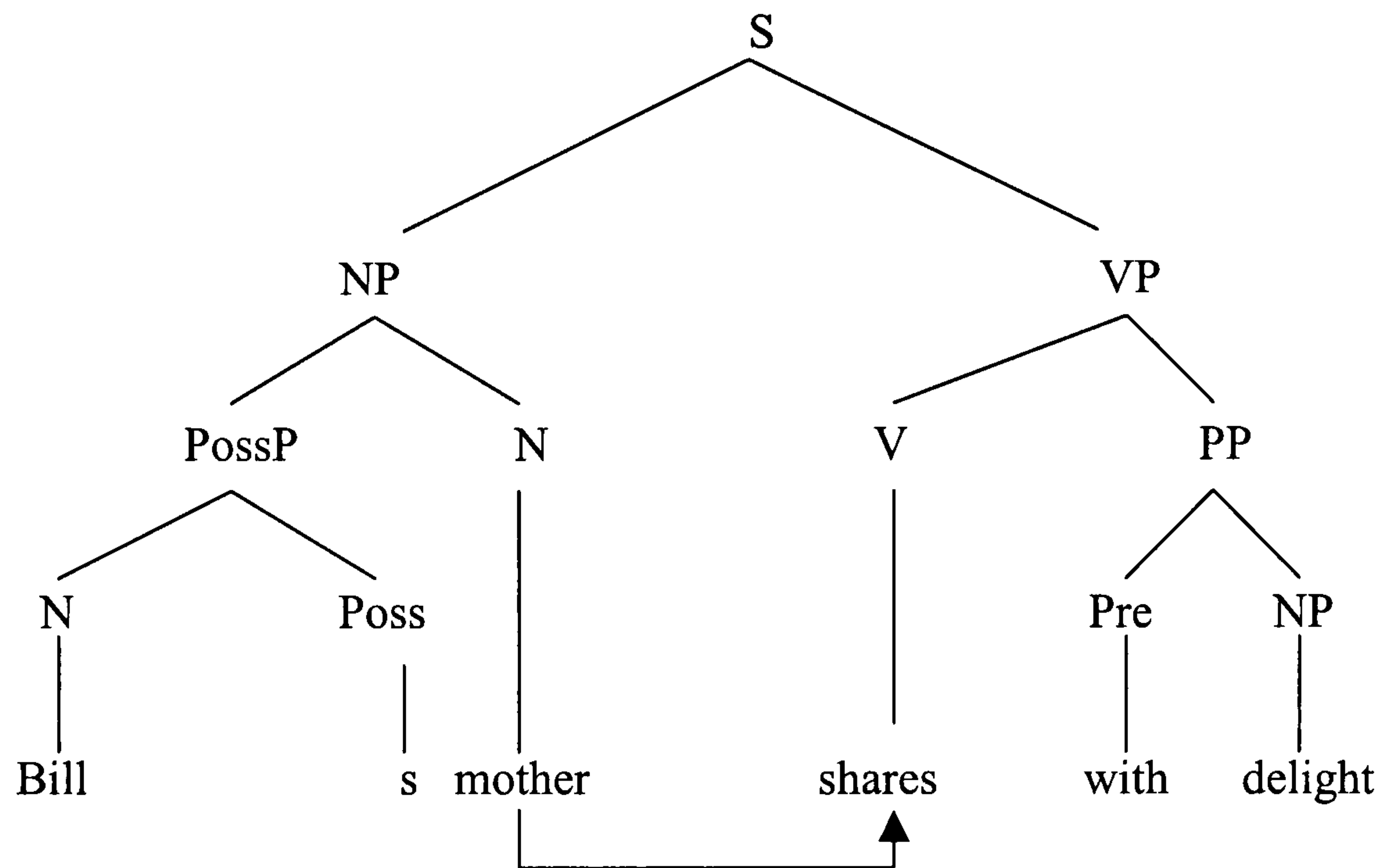
a)



b)



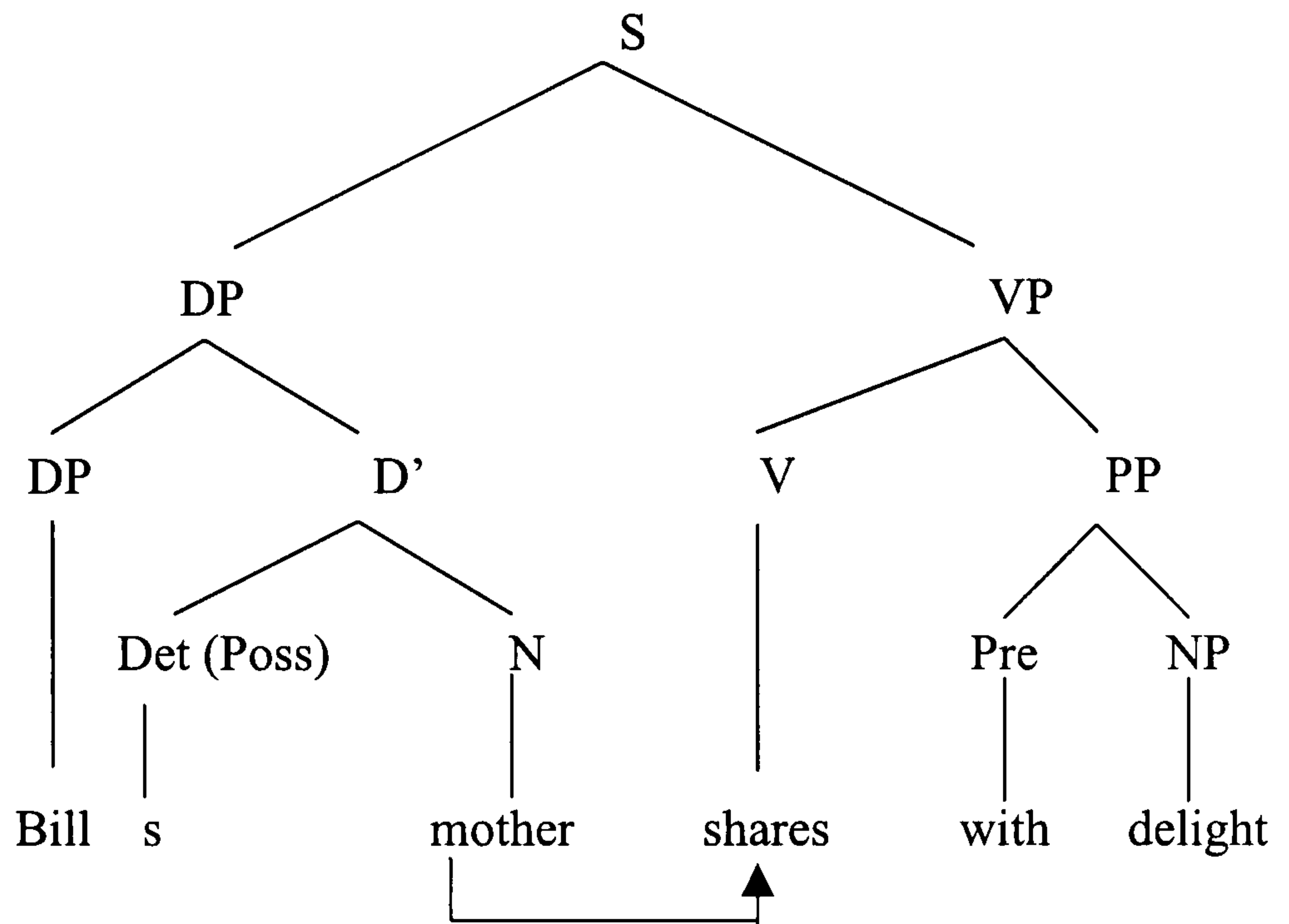
c)



Remember that there are 2 inconsistencies in these three examples: a) and c). The argument was that it depends on the length of noun-verb agreement, which is indicated by the arrows. An inconsistency like c) can even facilitate learning since the noun-verb agreement is even shorter than for the consistent example b).

Actually, we are confronted in these examples with only one inconsistency, which is a). Example c) is not an inconsistency if we adopt the analysis of a determiner phrase. To assume a determiner phrase makes sense in head-first languages since function words precede generally content words such as auxiliary verbs precede main verbs and determiners precede nouns and heads precede complements such as determiners precede nouns and as a preposition it is taken as a head. So if we replace c by c', then we get for c' a consistent structure.

c')



The findings of Christiansen and Devlin (1997:117) in the FANAL-database¹⁶ indicates that SVO-languages are more inconsistent: “The PossP search shows that there is a strong preference for SOV genera with postnominal genitives over SOV genera with prenominal genitives, that SVO languages only has a weak preference for prenominal genitives over postnominal genitives”. So, as we can see, the tendency towards prenominal genitives is weaker for SVO languages than the tendency for postnominal genitives is for SOV-languages. Anyways, of course the SRN does not have access to a determiner phrase analysis. It finds this structure easier because the noun-verb agreement is short. We might assume that this also happens in language learning generally, and that the DP-analysis might be a consequence of it. The weak point of the noun-verb agreement argument is that we then would expect all noun phrases to be head-last since verb-noun agreement is shorter. This is obviously not the case although

¹⁶ The FANAL-database, developed by Matthew Dryer, contains typological information about 625 languages, divided into 252 genera (language families).

it might explain why we find in English and German (and of course other languages) structures such as ‘Dem+N’, ‘Num+N’ and ‘Adj. + N’.

If we take now a look into the diachronical development of English, we might find a hint why this might be the case. The DP-analysis can explain this fact with support of historical facts. The s’genitive is a residue of an Old English case system, which is indicated below:

Old English Noun Declension

Strong	Masculine	Neuter	Feminine
Singular	(stone)	(deer)	(love)
<i>Feminine</i>	stan	deor	lufu
<i>Accusative</i>	stan	deor	lufe
<u>Genitive</u>	stan <u>e</u> s	deor <u>e</u> s	lufe
<i>Dative</i>	stane	deore	lufe
Plural			
<i>Nominative</i>	stanas	deor	lufa
<i>Accusative</i>	stanas	deor	lufa
Genitive	stana	deores	lufa
<i>Dative</i>	stanum	deorum	lufum
Weak	Masculine	Neuter	Feminine
Singular	(name)	(eye)	(sun)
<i>Nominative</i>	nama	eage	sunne
<i>Accusative</i>	naman	eage	sunnan
<i>Genitive</i>	naman	eagan	sunnan
<i>Dative</i>	naman	eagan	sunnan
Plural			
<i>Nominative</i>	naman	eagan	sunnan
<i>Accusative</i>	naman	eagan	sunnan
<i>Genitive</i>	namena	eagena	sunnena
<i>Dative</i>	namum	eagum	sunnum

Table 4.1

Old English did not have a determiner (Osawa, 1998), see the following examples for making this point clear:

22) fram beaduwe
from battle (mas. Dat.)
'from the battle'

23) Oddan bearn
(Odda (gen. Sg.) son (neut. Nom. Pl.)

24) Eall eorðe ys min
All earth is mine
'All the earth is mine'

25) besuðan Temese
south of Thames
'south of the Thames'

26) holtes on ende
wood (neut. Gen.sg.) on end (mas.)

In the history of Early English, especially in Early Middle English, English, case distinctions disappeared (Mustanoja 1960:67 and Allen 1995). Already by the time of Early Middle English (13th century), the distinction between the nominative, the dative and the accusative was completely lost in the nominal system. By the mid thirteenth century only two cases survived, the common case and the genitive. The genitive marker survived although there is a big difference to Old English. There is now only one genitive marker (e)s opposed to Old English where we have a full declination. By this time, a determiner emerged. We have a similar phenomenon in Old French, although Bauer (1995a) argues that this is independent of changes in morphology, but a trend in the reorganisation of branching and changes in morphology are only effects of causes. So, the genitive case was the most resistant in English, but does it still have the

same function in Modern English? Abney (1987) argues that the s'genitive functions as a determiner in Modern English. Since in Old English morphology marked the noun and the determiner was not existent, we can assume as Bauer (1995a) did for Latin, that the case morphology is a head, and so we would have a head-last structure, which changed by the emergence of a determiner to a head-first structure, since it is preposed. Since English noun phrases are not case marked, it does not make sense to assume that the s'genitive is a case marker. It seems that there are no languages with a two-case system. Janda (1981: 65) comments: "And it seems that no (other) language opposes a genitive case-inflection to a general case inflection that conflates all of the possible cases (nominative, accusative, etc.)". In the same line, Weerman and de Wit (1999) propose a case hierarchy by which it is impossible to have a genitive case when there is no distinction dative and accusative case as it is the case for Early Middle English and Modern Dutch. Lightfoot (1999:120) also assumes that a sudden shift which took place in the thirteenth century means that children had a 'new, caseless grammar' and were unable to interpret -es as a genitive case suffix. Lightfoot analyses it as a determiner in the following way:

27) DP[Spec[the cyning] D'[D[es] NP[godsunu]]]

One evidence that the '-(e)s' was not a case marker anymore, can be seen by a hypercorrective tendency that took place in the late 16th century (Allen 2003). At this time educated people started to interpret the morpheme /-iz/ as the possessive pronoun 'his' according to Allen (2003, 19) and started even substituting the 'correct' form /-iz/ with the corresponding feminine and plural possessors. She gives the following examples:

28) to God his protection (John Barrington, 1629, cited by Allen (2003, 19).

‘God’s protection’

29) Lucilla hir company (Lyly, Euphues, 1578, cited by Allen (2003, 18)

‘Lucilla’s company’

30) Beauty & agility their fame (Queen Elizabeth I’s Boethius, cited by Allen (2003, 18).

‘The fame of beauty and agility’

Allen (2003) points out that this hypercorrected genitive has never taken strong hold in England and soon disappeared.

It is worth pointing out that we can observe something very similar in variants of Modern German and Dutch. In Standard Dutch possessive relationships with proper nouns and kinship terms are expressed by a pregenitive genitive, which descends from the old genitive case (Weerman and de Wit, 1999).

31) Willems boek

William-s book

‘William’s book’

In Modern Standard Dutch, the possessive marker is not a case marker anymore but a determiner (Weerman and de Wit, 1999), similar as we discussed for English. In

colloquial Modern Dutch we find as a variant a periphrastic genitive construction constructed with a possessive pronoun.

32) de man met die gekke bril z'n caravan

the man with those funny glasses his caravan

'the man with those funny glasses's caravan' (Weerman and de Wit, 1999: ex. 39c)

In a southern German dialect, the Moselfränkisch (spoken in the Saarland (ex. 24, 25) and Luxembourg (*Lëtzebuergesch*¹⁷)), we find also a very similar construction as those discussed for Middle English and Colloquial Dutch:

33) dem Vater sei Auto

the father his car

'father's car'

34) mei Mutter ihr Schwester

my mother her sister

'my mother's sister'

35) dem Hans säi beschte Frënd (*Lëtzebuergesch*)

the Hans his best friend

'Hans' best friend'

¹⁷ Moselfränkisch spoken in Luxembourg, but the language is there an official language, and thus not considered as a dialect, while in Germany the variants are seen as dialects of German.

It is now necessary for us to see since we said that the genitive marker is a determiner if in Germanic languages the possessive pronoun could be a determiner.

Possessors are in complementary position with definite articles in English (Bloomfield 1933, Fries 1952).:

36a) my house

36b) *the my house

36c) *my the house

Possessors are in complementary position with definite articles in German:

37a) mein Haus

37b) *das mein Haus

37c) *mein das Haus

Possessors are in complementary position with definite articles in Dutch:

38a) mijn boek

38b) *het mijn boek

38c) *mijn het boek

Possessors are in complementary position with definite articles *in* Lëtzebuergesch:

39a) säi Duerf

39b) *dat säi Duerf

39c) *säi dat Duerf

In other languages, for example in Italian, this is not the case:

40a) la casa

40b) la mia casa

40c) *mia la casa

The possessive pronoun is a determiner in English (Lyons, 1986, Giorgi and Longobardi, 1991), while in Italian it is an adjective (Giorgi and Longobardi, 1991):

41a) la mia casa

42a) la bella casa

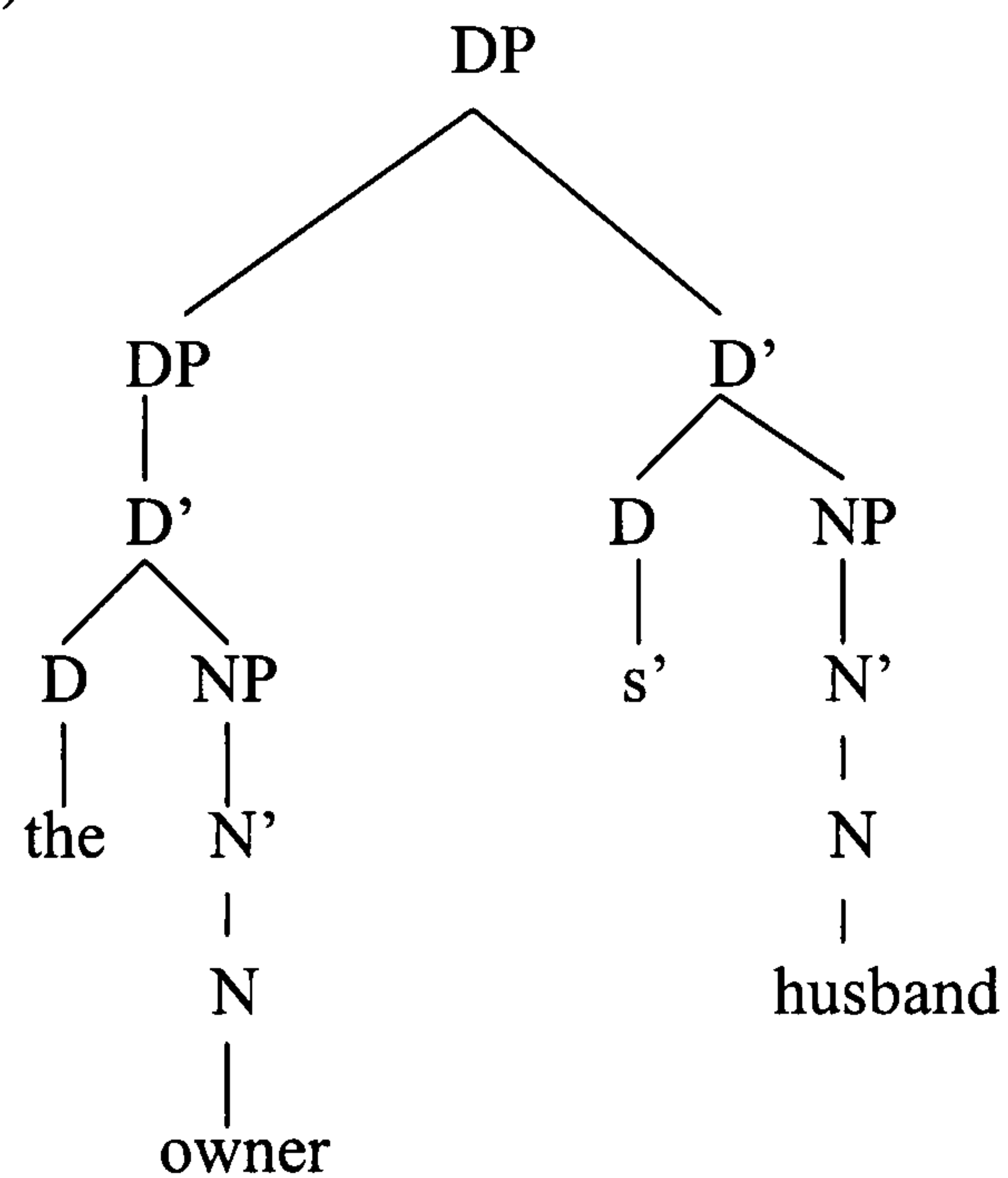
Which further evidence can we get that the s'genitive is a determiner in Modern English? For that, we have to look at the distribution of s'genitive phrases:

43)

The owner's husband

In a DP-analysis, it is analysed as followed:

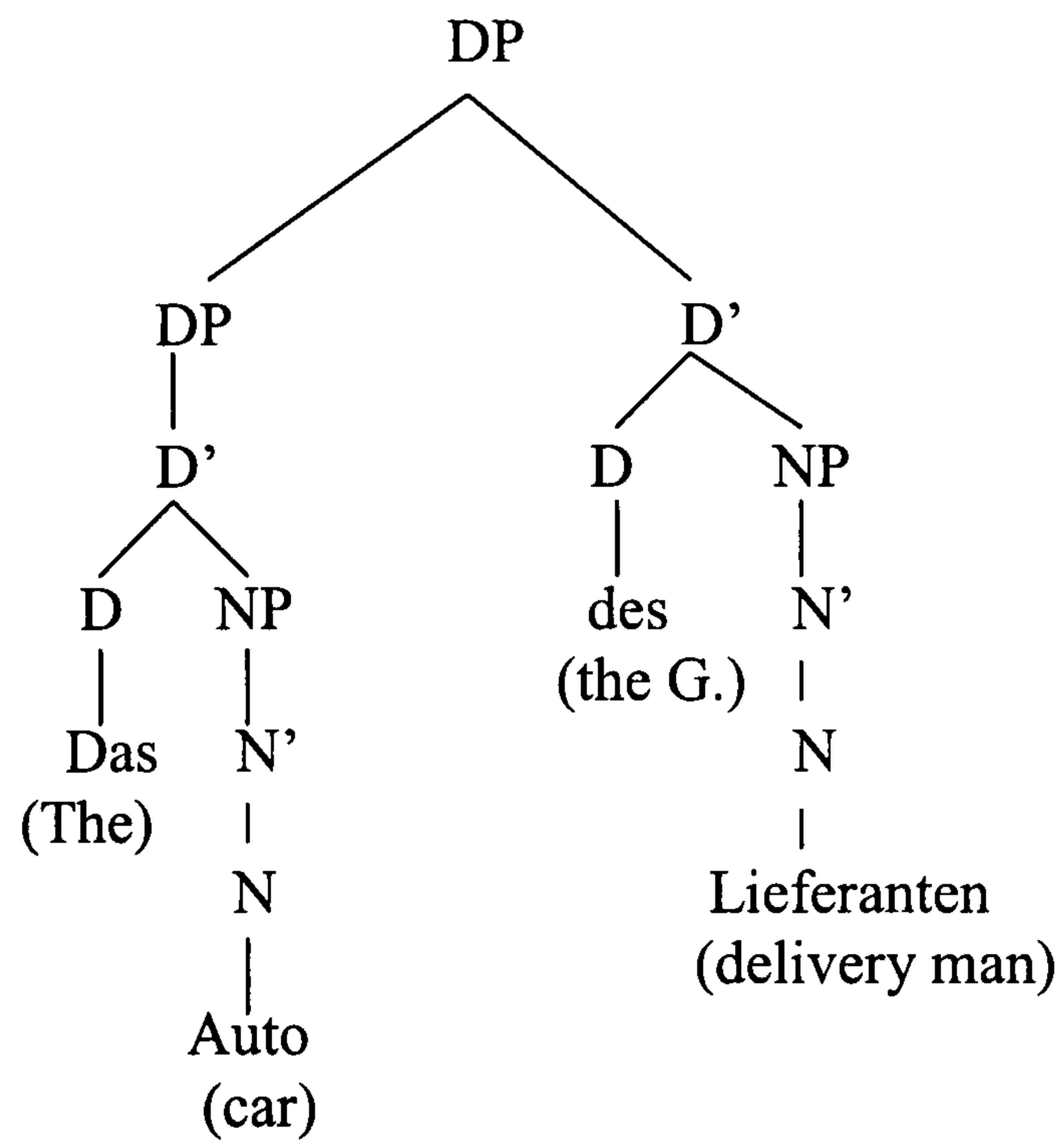
a)



In German, the postposed periphrastic genitive structure (head-first) is analysed as the English Saxon Genitive as a DP-phrase. 'Des' is the determiner in the genitive case (see table in footnote¹⁸):

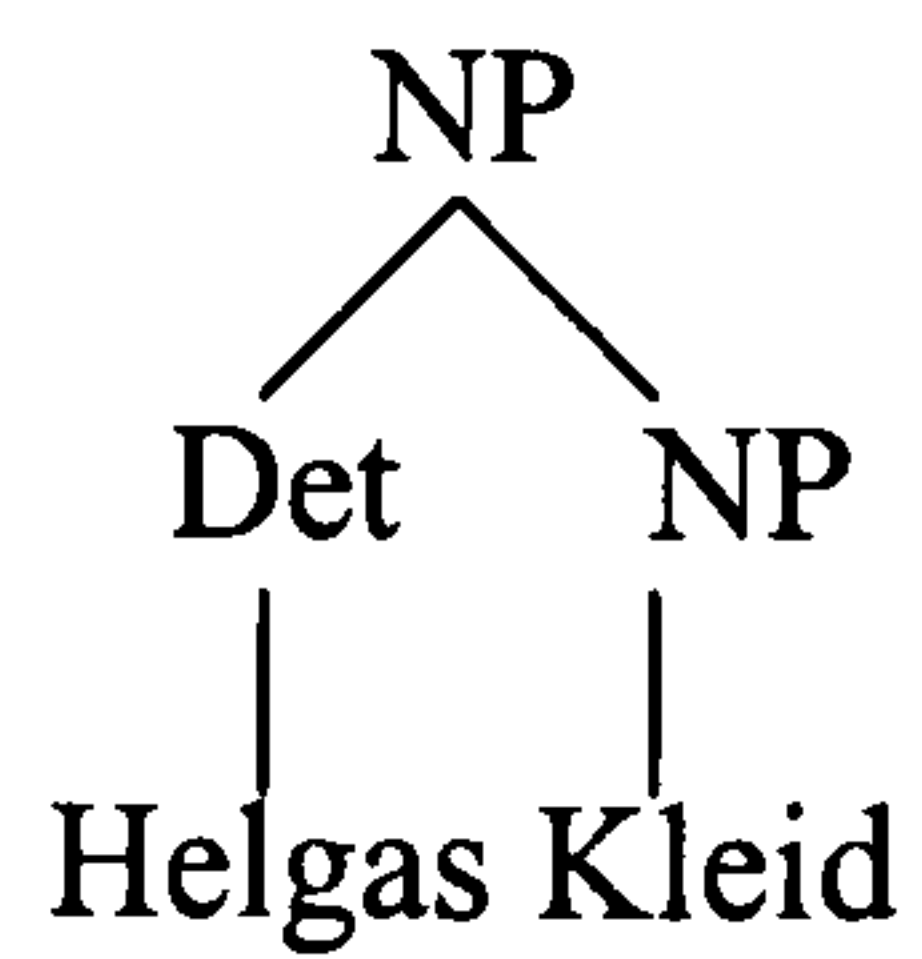
¹⁸	Masculine	Feminine	Neuter
Nominative	der	die	das
Accusative	den	die	das
Dative	dem	der	dem
Genitive	des	der	des

b)



The German Saxon Genitive can be preposed or postposed:

a) preposed Saxon Genitive (Heidolph et al., 1981:306)



In this case a determiner cannot be preposed:

44) *das Helgas Kleid

45) *ein Helgas Kleid

b) a postposed Saxon genitive can be preceded by an undetermined article:

46) ein Freund Helgas

a friend Helga's

'a friend of Helga's'

47) *der Freund Helgas

the friend Helga's

48)*ein Helgas Freund

a Helga's friend

We can see that there is a functional differentiation between a preposed and a postposed Saxon genitive in German. The preposed genitive is definite, while the postposed is indefinite¹⁹. So there is no grammar competition. We can argue since the preposed is already determined a further determiner is redundant. The same can be said for the possessive pronoun since 'my car' is already determined a further determiner such as '*the my car' could be redundant. Haiman (1983) proposes an "economic motivation", which says that a possessor is very likely to be definite, so speakers can economize by omitting the article. So, a possessor can be definite, and very likely have the function of a determiner.

¹⁹ See also English 'a car of Peter's', which means he has several cars or in French 'un appartement à moi', which also means one of my apartments.

So, in Modern English we have two different genitive structures. The Saxon prenominal genitive like *the man's hat* and the postnominal Norman genitive, for example *the roof of my house*.

At about 900, Old English had two inflected genitives, one was preposed and the other one was postposed. So we had for the king's wife '*cyninges wif*' for the preposed genitive and '*wif cyninges*' for the postposed one. Both constructions occurred with equal frequencies, so around 50%. After that the preposed genitive increased, while the postposed declined so that around 1200 the preposed genitives was about 85% and the postposed genitives declined to around 10%. Then the preposed genitive construction was gradually replaced by the periphrastic genitive construction '*wif of cyng*', which then grow rapidly so that in a hundred years the postposed periphrastic genitive construction increased from 5% to 85% while postposed inflected genitive constructions disappeared and preposed inflected genitive constructions declined to 15%. First, we have seen that when both genitive structures were inflected, the preposed genitive structure, which is left-branching, increased, although the language had a general tendency to develop towards right-branching. We would expect this development if we take into account the distance noun-verb agreement as we have seen above (Christiansen and Devlin (1997)). Then the periphrastic structure, the Norman genitive, has been introduced in the language. The development of the periphrastic Norman genitive has followed the S-curve pattern (Yngve 1996:59-60). McMahon (1994:52-53) asserts that changes begin slowly, then speed up the rate of diffusion at around 20% and rapidly increase up to 80% after which the change slows down again.

Figure: English Genitive structure

Grammatical Change in English from 900AD to 1500AD

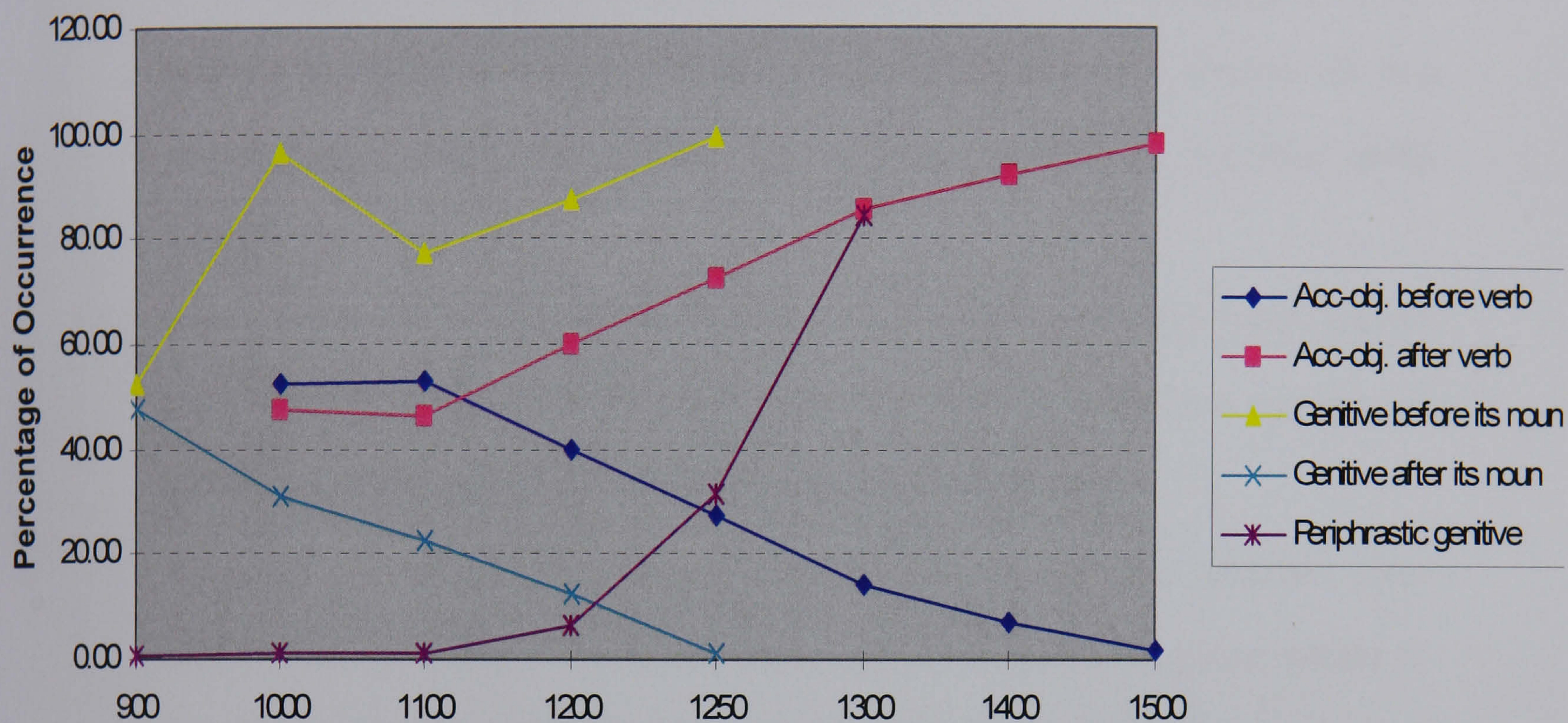


Figure 4.1

Source: Data by Fries (1969), graph established by Herbert Stahlke (sent by e-mail)

Table: Percentage of genitive constructions

Year	900	1000	1100	1200	1250	1300	1400	1500
Acc-obj. Before verb		52.50	52.70	40.00	27.60	14.30	7.00	1.87
Acc-obj. After verb		47.50	46.30	60.00	72.35	85.70	92.00	98.13
Genitive before its noun	52.40	69.10	77.40	87.40	99.10			
Genitive after its noun	47.60	30.90	22.60	12.60	0.90			
Periphrastic genitive	0.50	1.00	1.20	6.30	31.40	84.50		

Table 4.2

Source: Data by Fries (1969)

This means that the change from the preposed inflected genitive to the periphrastic genitive started slowly and then the change accelerated and slowed down again. So, as long as we had two inflected structures, the preposed genitive increased although it is left-branching, but when a more analytic structure as the periphrastic genitive was

introduced, the right-branching structure was winning. But, we still find in Modern English preposed genitive structures although the Norman genitive is more frequent than the Saxon genitive (Comrie, 1989). According to Kroch (1994) and Kirby (1999), the Saxon genitive became favoured for animates, while the Norman genitive became reserved for inanimates. So, we have a functional differentiation between the two genitives, which might also explain why the Saxon genitive has not been totally replaced.

Since the Saxon Genitive (preposed genitive) comes from a time where English did not have determiners, we can assume that a reanalysis took place and that the preposed genitive is analysed in a way that it fits with the determiner phrase.

In a head last language the morphological head is final through noun inflection. Since such an analysis is not possible for the Saxon Genitive anymore, we assume that the 's' is analysed as a determiner as it is assumed in the generative framework.

So, all inconsistent structures should then be more difficult to learn, those structures that after Christiansen and Devlin (1997) facilitate learning turn out to be consistent if a DP-analysis is applied. So, the only inconsistencies are those that are based on a mixed rule set and those where noun-verb agreement is long.

4.3. Recursive rule sets in Noun Phrases

Here, we will consider genitive constructions in recursive rule sets. According to Christiansen and Devlin (1997), recursive inconsistencies are hard to learn and do not exist in languages or are fast replaced by consistent ones. We have seen in chapter III that morphology changed only after the main constituents changed. Let us see the implications in the following at examples from different languages.

In Old Latin, the genitive was left-branching:

49) *Senatuos sententiad*

Senate-Gen. decision-Abl.

‘with the decision of the senate’

(Bauer 1995a)

Then, there was a right-branching tendency in Classical Latin:

So we had: 50) *Casa femin/ae*

Casae femini/arum

So we get:

NP -> [N (Gen)]

Gen -> [N Poss]

This structure seems to be inconsistent, because the possessive marker is still final.

Determiners developed afterwards and first other constituents had a right-branching tendency in the NP. The possessive marker is an inflection and inflections as we said above only changed later on.

We find a very similar phenomenon in Old English²⁰. Like in Latin, Old English did not have determiners. Around 900, we had two inflected genitive phrases, which occurred with the same frequency, i.e. around 50%. One was preposed and the other one was postposed.

So we had for the preposed genitive:

51) *cyninges wif* (the king's wife)

and for the postposed one:

52) *wif cyninges*

In 52), we would expect the possessive marker to precede the noun. A recursive set allows for multiple embeddings. Our present recursive rule set as formulated above would give us in Old English the following structure for 'the king's wife's maid:

53*) *maid wif cyningeses*

This structure is not correct and Old English and Latin are not agglutinative languages, and thus we cannot extend the final case markings. So, does this mean that the inflection

²⁰ See also Icelandic:
Þetta hús mannsins
this house man-G-the-G
'this house of the man' (Delsing, 1998: ex. 32b)

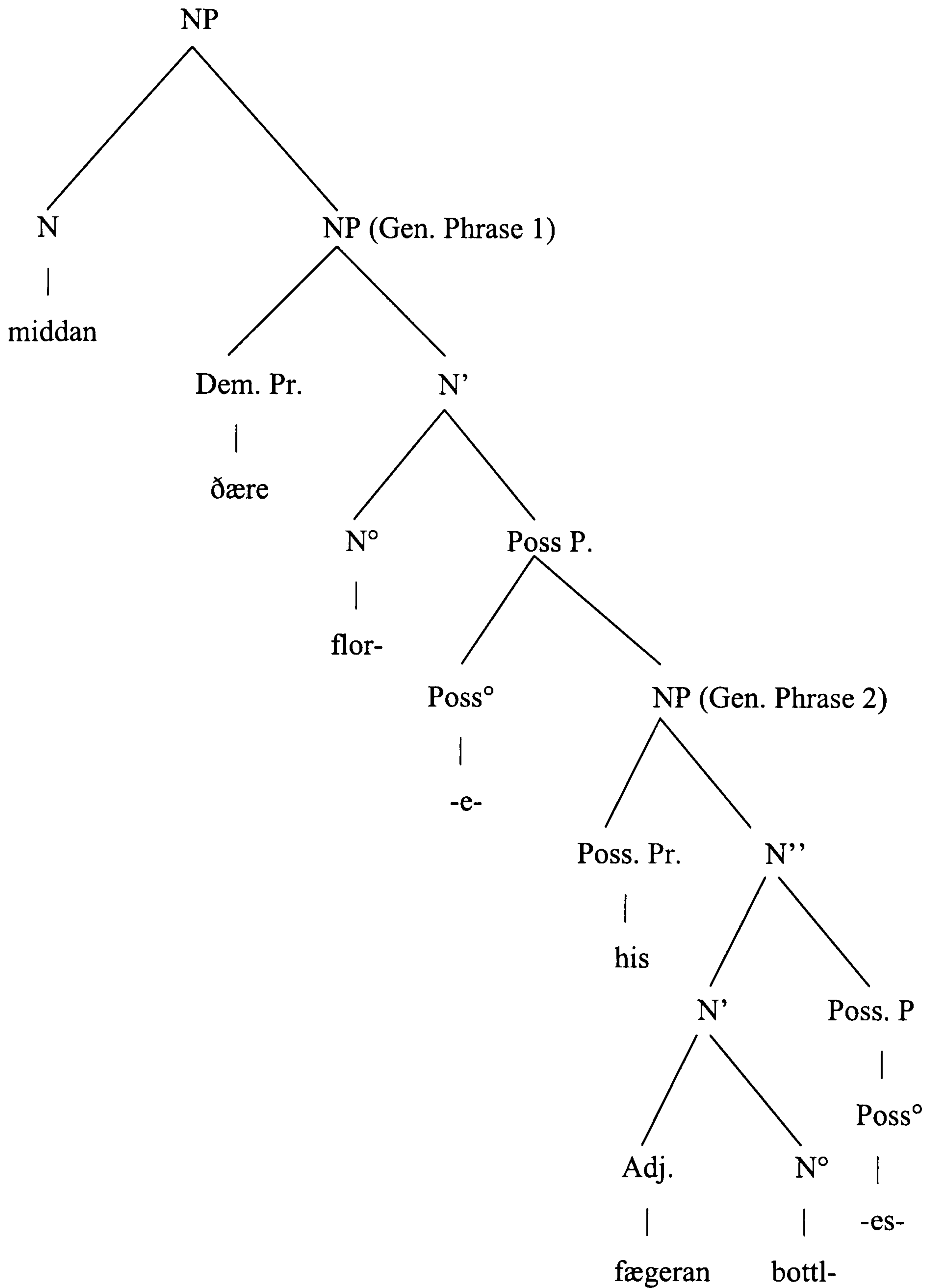
blocks a further embedding? As we will see further embedding is possible. Let us consider the next example:

54) on middan ðære flore his fægeran bottles

in middle this floor (fem. Gen.) his fair bottles (masc. Gen.)

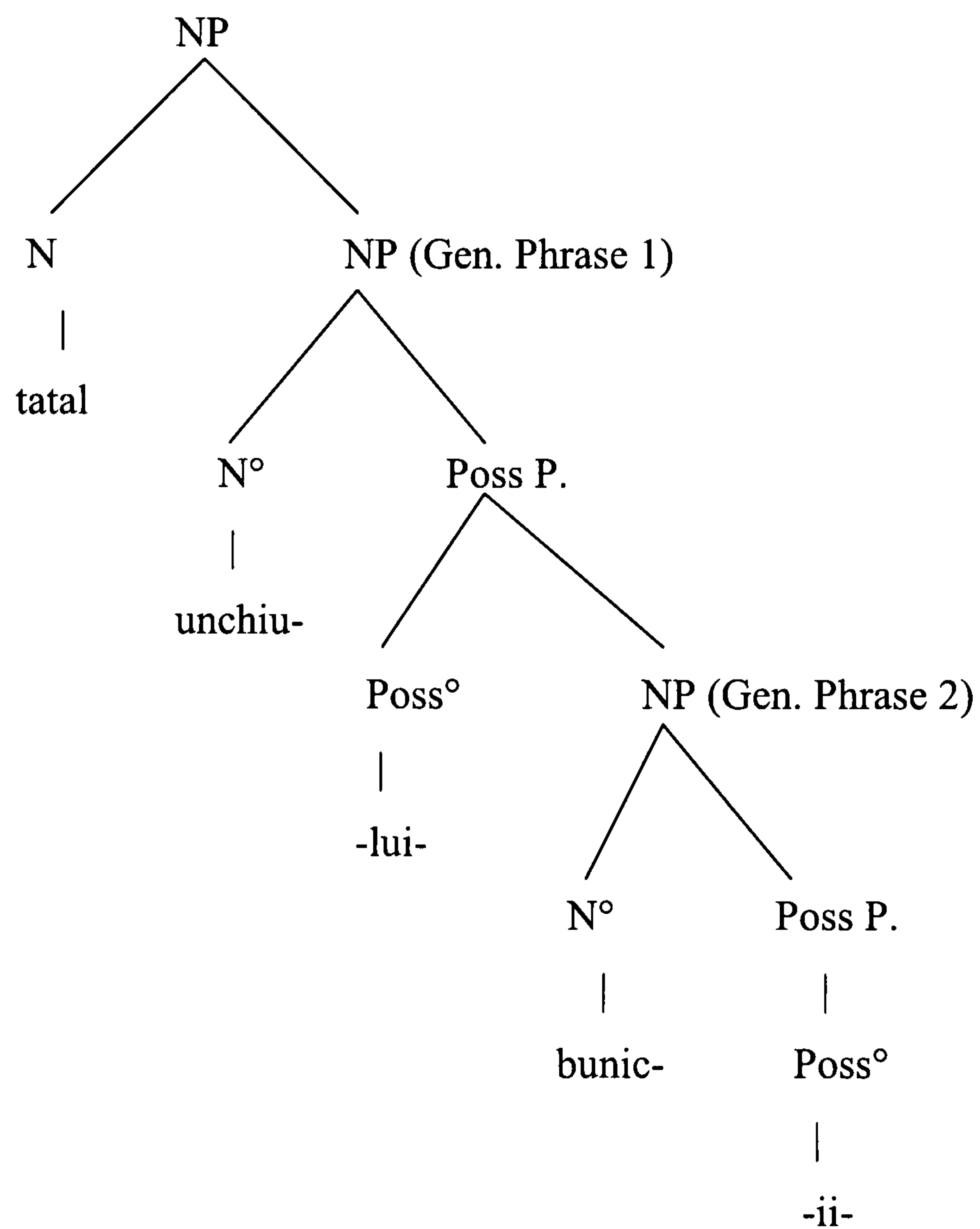
‘in the middle of the floor of his fair cottage’

‘Middan’ (middle) is the head noun, and the other nouns also follow in the order as if we expect it in a head-first language although the possessive marker is final. We can represent it in a tree in the following way:



Let us also consider such a structure in Romanian, which is also an inflectional SVO-language. This example is clearer than the previous one in Old English because in this

Romanian example we do not have a demonstrative and a possessive pronoun and not an adjective. The principle for recursive genitive phrases is still the same here.



55) tatal unchiului bunicii

Tata+l unchi +u +lui bunic+ii

Noun+Det. Noun+supporting particle+Genitive marker Noun+Genitive marker

The father uncle of grandmother of

‘Grandmother’s uncle’s father’

We have seen that head-first structures with case inflections can have their inflectional marker in final position. But it does not exclude recursiveness, even if it is not an agglutinative language, and elements are still ordered in a right-branching manner. For such languages, we have to establish another recursive rule set. The recursive rule set established by Christiansen and Devlin (1997) is valid for analytic head-first languages, thus in a language where genitive markers are autonomous particles. In languages with case inflections, thus synthetic, we have to establish an additional recursive rule set:

NP -> [N (Gen)]

Gen -> [N [PossP]]

PossP-> [Poss (NP)]

This structure is not very elegant because we have an additional phrase. A parser has to decide if a language is an inflectional language or an analytic language. In the first case, then the parser has to add a Possessive phrase. In head last languages it does not matter if the inflection marker is part of a synthetic structure (thus case marker) or a particle that follows the noun.

Chapter 5

Adpositions

Introduction

In the following, we will discuss the diachronic development of adpositions in focusing on German. In German we find predominantly prepositions, and only very few postpositions. This is an interesting case for two reasons:

- 1) Why does German have prepositions although it is a verb-final language, where we would rather expect postpositions. We discussed this point already partly when we were saying that the German noun phrase is head-first, and then we would also expect prepositions
- 2) More interestingly, why do we find still some postpositions in German? Since German like all Indo-European languages had a tendency towards right-branching, we could expect that postpositions are only remains from a time when German still had dominantly postpositions. But as we will see, this is not the case. German's postpositions developed in the 17th century, at a time, when German had only prepositions. This is interesting in so far that the emergence of postpositions is a counter-example of the general observed trend of right-branching, a so-called 'retrograde change'. We will argue that it is a reanalysis of another particle.

First, we will generally discuss how adpositions emerge through the process of grammaticalisation. Then we will discuss the German case. First, we will look how these postpositions developed during language change. Then we will propose an

explanation, so that we do not have to postulate a retrograde change. We postulate that a majority of those postpositions developed out of verb particles, which have distinctive properties.

Then, finally we will show in an experiment, where people judge sentences, that certain verb particles have properties such as fronting, which makes them more likely to develop into postpositions.

5.1. Diachronic Development of Adpositions

Adpositions often result from lexical elements, which are reanalysed into functional categories. Latin *casa* (house) has been reanalysed into a preposition in French *chez* (at somebody's place). So a noun, which is a lexical element can be reanalysed into a preposition, which is a functional element. In German the preposition *während* is derived from a verb, which means 'enduring'. The passage from lexical elements to functional elements is called grammaticalisation and is said to be unidirectional, which means that functional elements cannot turn into lexical ones. Grammaticalisation processes might give us a further information on word order consistency as we will see in the following, but it does not explain why a language change from left-branching towards a right branching language.

According to Givón (1984), there are two main diachronic sources for adpositions: serial verbs and genitival constructions. In Yoruba, for example, serial verb constructions have been reanalysed as prepositions. So, the verb *fí* 'take' has been reanalysed as a marker of instrumental nominals (Givón 1984).

56) *Mo fi àdé gé nakā*

I took machete cut wood

‘I cut wood with the machete’

Similar reanalysis occurred in the same language with *fun* ‘give’, which became the dative marker, and *gaa* ‘go’, which was reanalysed as a locative marker.

In Ijo, on the other hand, which is an SOV-language, reanalysed serial verb elements as postpositions (Givón (1984)).

57) *Eri ogidi aki-ni indi pei-mi*

He machete take-ASP fish cut-ASP

‘He cut fish with the machete.’

But even in languages without serial verb constructions, according to Aristar (1991), such reanalysis occurred. The English preposition ‘concerning’ emerged from a participial object construction, and this new adposition is a preposition since in English objects follow verbs. In German, where we find ‘betreffend’, which is the equivalent of English ‘concerning’, the adposition is postpositional because German participles like all infinite verbs appear after the object. Anderson (1979) shows analogous developments in Sanskrit. Sanskrit used to be an SOV-language and some postpositions developed out of these verb-structures:

NP-ACC *ādāya* ‘having taken NP’ -> ‘with NP’

NP-ACC *uddīśya* ‘having shown NP’ -> ‘for NP’

NP-ACC *grhitva* ‘having taken NP’ -> ‘with NP’

NP-ACC *muktvā* ‘having freed NP’ -> ‘except NP’

Another source of reanalysis is the genitive construction. According to Aristar (1991), the derivation of adpositions from genitival constructions seems to be the most common strategy. Bybee (1988) showed that pre- and postpositions often developed from older genitive-head noun constructions, whose internal order determined the development of pre- and postpositions. In English, according to Aristar (1991), we find “clear evidence of varying diachronic stages in genitive construction”. According to Aristar (1991), recent English adpositions derive from the modern analytic genitive construction such as *on top of* N and *because of* N and older ones derive from the period of synthetic genitives such as *beside(s)*, *beneath*, and *behind*.

Aristar (1991) states that “original sequences of genitives and heads have been reanalysed as adpositional phrases, with the original head reinterpreted as an adposition”. So, we should then find prepositions in languages where the genitive follows its head and postpositions in those languages where the genitive precedes its head²¹:

NP GEN -> PREP NP

GEN NP -> NP POSTP

Such grammaticalisation processes, so Aristar (1991), can contribute explaining language universals as established by Greenberg:

²¹ In this case, we should expect postpositions in English since the genitive precedes the head in the English genitive phrase. But as we will see a postposition can turn into a preposition and recursive rule sets put pressures on consistency as well. German has some postpositions, but even here very rare, and German has more OV-features than English.

If prepositional phrases derive from genitive phrases in the way hypothesized, then prepositions should – at a greater level than chance – co-occur with N-Gen order. Conversely, postpositions should co-occur with Gen-N order. Similarly, if serial verbs and participials are also a source for adpositions, then again prepositions should occur more often in VO languages, where verbs precede their objects, while postpositions should occur more in OV languages, where verbs follow their objects.

(Aristar, 1991)

Bybee (1988) also points out the correlations between the order of governing noun + genitive and the use of pre/postpositions, which is according to her a result of grammaticalisation.

But these grammaticalisation processes, so Aristar (1991) could help explaining the existence of inconsistencies, since grammaticalisation processes are often likely to occur, but do not have to occur, and changes are often unpredictable in this sense. One of the predictors if grammaticalisation takes place seems to be frequency according to Haspelmath (1999).

The more frequent a construction, the greater the chance that it will grammaticalize (Haspelmath).

So, for example, case markers arise from full nouns and verbs by grammaticalisation in language change, and only frequently occurring full words grammaticalise to become case markers.

Grammaticalisation is the process by which grammatical words emerge. Grammaticalisation is a diachronical explanation, which shows how usage can influence the change of language. It is a different approach than those based on processing and acquisition. But all these approaches explain different aspects of the reality of language and one does not necessarily exclude another explanation. Processing can, for example,

show us why consistency is somehow more optimal, which does not exclude that grammaticalisation processes can take place. Often they even go hand in hand, when for example head-last languages develop postpositions and head-first languages develop prepositions. But the position of adpositions can change in time, and then the processing explanation might help us explain what happened. Acquisitional theories explain how children or even adults learn a language, and acquisition theories might even help us understand why changes take place in the acquisitional process. Frequency is for example an important factor in acquisition and grammaticalisation. Of course, grammaticalisation is more concerned with adult usage than with general acquisitional processes. But none of the theories have necessarily to exclude another one, and grammaticalisation might be helpful to understand ‘historical accidents’ and why and how some inconsistencies might have emerged.

To conclude, we can say that there are two independent paths for the production of adpositions, one verbal and one nominal and frequency is an important factor in such grammaticalisation processes.

5.2. Adpositions in German

Christiansen and Devlin (1997) used the Fanal database, which contains typological information about 625 languages, divided into 252 genera (language groups or families). They found in the database that “SOV genera with postpositions are strongly preferred over SOV genera with prepositions, whereas SVO genera with prepositions

are preferred over SVO genera with postpositions”. This is also as we have seen before an observation of Greenberg and Dryer.

Proportion of postpositions and prepositions

Structure	Proportion of Genera
SOV-Po	0.61
SOV-Pr	0.03
SVO-Po	0.03
SVO-Pr	0.33

Table 5.1

SOV-Pr exists in German subordinate clauses. In the tagged part of the Cosmas-corpus²² we find 1,735,379 adpositions. 1,727,913 of these adpositions are prepositions (99.57 % of the adpositions) and only 7,466 are postpositions (0.43 % of the adpositions). German parses so dominantly prepositions.

5.3. The emergence of postpositions in German

5.3.1. Introduction

Generally, languages exhibit a unidirectional tendency to develop from left-branching towards right-branching languages. Left-Branching refers to the fact that the branching

²² Tagged part of the Cosmas II corpora. Institut für deutsche Sprache, 2003: www.ids-mannheim.de/cosmas2. These are 18.22 millions word forms of German newspaper texts.

of an X-bar structure would be left-branching, what we find in languages which have the head to the right of the complement, i.e. head-last. Thus the genitive, which is the complement, precedes the head noun (N Gen), the adposition follows the noun, here being the adposition the head (N P) as determiners should follow the noun etc. Another characteristic of left-branching languages is that they usually exhibit synthetic morphology (Bauer, 1995a). Synthetic morphology means that function words are fused with content words and cannot be separated from each other. Thus in Latin the synthetic form *laudabo* has two equivalents in Modern French, one synthetic one, which is '*je louerai*' and another analytic one, which is '*je vais louer*'. In English we only have an analytic future form, which is 'I will praise'. Right-branching languages have the head to the left, which means that the tendency is unidirectional since once left-branching structures have been transformed into right-branching ones, the process cannot be reversed (Bichakjian, 1991), Bauer, 1995a). But in the process of right-branching in some languages retrograde changes were observed, which are postulated as major exceptions to the general trend. Bauer (1995b) discusses two examples. First she mentions that Latin reintroduced postpositions at a time when prepositions were already dominant. The same happened in German according to Bauer (1995b). Here, we will discuss the German case and we will see that the introduction of postpositions does not have to be considered as an exception of the general trend towards right-branching. We will show that German introduced postpositions by processes known as grammaticalisation, while the language still continued developing further right-branching structures.

Lehmann (1971) and Hawkins (1979) also argue that German introduced OV-structures (thus left-branching) structures, and that German introduced for that reason postpositions. In the following, we will discuss first how German word order changed

historically and its possible implication for the emergence of postpositions. Then we will discuss how German postpositions developed in Early New High German in discussing the etymology of these particles, which came into postpositional usage. We will see on the one side that some postpositions emerged from adverbs, which then used as verb particles got quite close to adpositional usage. These elements occurred in a position following the noun. The particles that developed into postpositions could undergo fronting, while particles that could not be fronted did not undergo such development. Frontable particles can be contrasted in constructions where they occur. So 'along' can be contrasted with 'down', 'up' etc in a construction such as 'to go along'. Unfrontable particles occur in more idiomatic constructions, so in 'to eat up (aufessen)', 'up' cannot be contrasted with another particle. Particles that could be fronted gave way to the development of postpositions.

So, if we have an unmarked sentence such as: 'I go the way along'. The particle 'along' can be fronted such as in 'Along go I the way'. When postpositions arose, not only the particle could be fronted but as well the preceding noun. So we could get 'The way along go I'. The object noun and the particle are adjacent and it is known that this favors grammaticalisation. Other particles were reanalysed from a similar position adjacent to the noun. We will discuss the following major points:

1. When such adverbial verb particles got used as an adposition (noun-governing particle), it first got used as a postposition, but where the borderline between adverb and adposition is not always clear cut.

2. Once adpositions are embedded in another NP (recursive rule set), the head noun must be first. The adpositional phrase embedded in this head noun is usually a prepositional phrase, what is expected since the head noun comes first. But in very marked circumstances as we will see later the head noun can also be followed by a postpositional phrase, but this is a very marginal structure. The head noun can never be final, which explains why in such constructions prepositions are predominant even with adpositions that can be used as postpositions. Because of recursive consistency, adpositions in a recursive rule set tend towards prepositions since the head noun is always head-first.
3. Infinite verbs can also be reanalysed as postpositions since they follow the noun like verb particles. Both infinite verbs and verb particle do not have an agreement pattern, which also favours reanalysis.
4. And finally we will also see how nouns can be reanalysed into postpositions. This happens in a structure called circumposition, a left-branching genitive phrase (Gen-N) is preceded by a preposition, and the head noun of the genitive phrase will be reanalysed as a postposition. But prepositional use occurs early and increases generally.

We argue that the emergence of postpositions does not constitute a word order change since postpositions have the tendency to develop into prepositions. Thus we argue that the introduction of postpositions are not counter-examples of the general tendency towards right-branching, but reflect rather surface structures that are reanalysed from a non-adpositional element that occur in a position following the noun. These non-

adpositional elements can be infinite verb elements such as verb particles and infinite verbs (infinitives, participles) or a left-branching genitive where the noun following the genitive is reanalysed into a postposition. This reanalysis did not change the intrinsic nature of syntactic structures. Right-branching noun phrases did not undergo a retrograde change towards left-branching. Elements that occurred as new particles reanalysed from a position following the noun had to be generally prepositional once an adpositional phrase could be used recursively, what we call, following Christiansen and Devlin (1997), a recursive rule set²³. The emergence of postpositions did not stop the general tendency of further right-branching. Thus, genitive phrases underwent further right-branching. Generally, we can say that the more ‘grammaticalized’ a German adposition gets, the more likely it is to be prepositional.

5.3.2. A retrograde change in German?

Without knowing the development of German, one could easily assume that the minor postpositions occurring in German are archaic structures dating from a time when German was a more left-branching language. The fact that still existing postpositions decrease in frequency would fortify our hypothesis that German’s earlier language stages had major postpositions and that through the process of right-branching postpositions were gradually replaced by prepositions. This is the general scenario that is reported for many languages (see e.g. Bauer, 1995a, for Romance). Surprisingly, one will notice that nowadays postpositions were introduced in the 17th century, at a time when German had apparently only prepositions (see Lehmann, 1971). From this fact, we might assume that German had an unusual development in the sense that it

²³ For example NP -> NP (P (NP)).

introduced left-branching structures, what would be considered as a retrograde change (Bauer, 1995b, Lehmann, 1971). In the following we will take a look what might have happened in the language development of German that might justify such an unusual change. Starting from Old German, we will see roughly how German's phrase structure changed. Our position in this chapter is that German did not undergo a retrograde change in the sense that we can speak of further left-branching. Reanalysed elements already occurred in such a position before reanalysis took place, but once they are 'proper' adpositional, they have to be prepositional. We will also see that it depends on the degree of grammaticalisation. The important question here is what changes took place in language change that privileged the reanalysis of non-adpositional elements into postpositions at a certain period. We will see in the following that the introduction of the complementizer made word order more rigorous and for this reason especially infinite verb elements gave way to possible reanalysis of infinite verb elements into adpositional elements.

5.3.3. Diachronic development of German's verb phrase

In the following, we will take a look at changes in the verb phrase and discuss possible outcomes for the emergence of postpositions.

According to Pittner (1995), the verb positions we find in New High German, i.e. V1, V2 and verb-final, already existed in Old High German. According to her, "it is now generally agreed that Proto-Germanic was of the SOV-type, which means that V-end was prevalent". In distinction from New High German, verb final position was still

possible in main clauses in Old High German. But this use became more and more marked. In the Middle High German period, German developed more verb-medial structures: prepositional phrases and NP's became increasingly frequent to the right of finite and non-finite verb forms (infinitives, participles and particles) though German never developed to a basic SVO-language (Lockwood, 1968).

In subordinate clauses verb final position was in Old and Middle High German not obligatory as it is in New High German, i.e. that verb-final position was not dependent on the existence of a complementizer as it is in New High German. But still, verb-final position was more frequent in subordinate clauses than in main clauses. The only actual syntactic change in verb position that took place is that finite verb-final is dependent on a complementizer according to Lenerz (1984). Lenerz (1985) points out that verb final position was possible in subordinate clauses without a complementizer in Old High German and New High German.

In Modern German, there is no independent verb final position in finite clauses. Verb-final position can only be introduced by a subordinating element. According to Lenerz (1985), Old High German as well as Proto-Germanic did not have complementizers, but verb-final order was frequently used for marking dependency.

58a) wánu sie iz intríatin

believe (1. sg.) they it feared

'I believe they were afraid of it

(Otfrid I²⁴, 27, 11, Lenerz, 1985: 106)

58b) ich waen der schade von im geschach

I believe the damage from him happened

‘I believe he was responsible for the damage’

(Willehalm²⁵ 85,9, Lenerz, 1985:106f.)

Complementizers were then gained from other word classes such as demonstrative pronouns, adverbs or prepositions, which were reanalysed as being in the first position of the following clause. The complementizer ‘dass’ (that), for example, developed out of a demonstrative pronoun. In subordinate clauses there was a search for lexicalisers that could be used as conjunctions that could be found in main clauses adjacent to the subordinate clause as for example ‘dass’. We can illustrate this in the following way:

We have two main clauses. If we combine them, the demonstrative pronoun of the first main clause can be used as a complementizer:

59a) Ich denke dass

I think that

59b) Du hast Recht

You are right

59c) Ich denke, dass du Recht hast

I think that you right are

‘I think that you are right’

²⁴ *Otfrids Evangelienbuch*, edited by Oskar Erdmann. Tübingen: Niemeyer, 1973.

²⁵ *Wolfram von Eschenbach*, edited by Karl Lachmann. Berlin/Leipzig: de Gruyter 1926. Reprint Berlin: de Gruyter 1965.

In this way, so Pittner (1995) argues, the sentence structure with a complementizer phrase was generalised, whereas the “old structure” with no complementizer phrase became increasingly archaic and restricted in its use. According to Weerman (1989), main clauses were more and more marked by a fixed position in the complementizer position (V2), which means that verbs in main clauses have to appear in the complementizer position. When in New High German (see Lehman (1971)) the complementizer got introduced verb-final structures got fixed, which means that infinite verb forms always had to appear in sentence final position in main clauses and that both finite and infinite verb forms are final in subordinate clauses.

We are interested in the effects the change had on infinite verb elements. Infinite verb elements had from then on to appear in unmarked²⁶ sentences in final position. Let us take a look at an example:

60) **Wie wir bey kommenden Jahren verabsäumen den Catechismus ...**

How we by coming years dislike the catechism

‘How we will dislike the catechism in coming years’

(Hieber, 1724²⁷, cited by Konopka, 2003:56, ex. 9)

²⁶ We discuss scrambling of verb particles as it occurs in topic position later on in the article.

²⁷ Hieber, Gelasius, 1724: *PARNASSUS BOICUS, Oder Neu=eröffneter Musen=Berg/Worauf Verschiedene Denck=und Leßwürdigkeiten auß denen Landen zu Bayrn/ abgehandelt werden*. Bd. 2, 7,-12. Unterredung München.

In this example, the infinite verb is not in final position, and it still precedes the accusative object. We said that after the change these elements had to occur in sentence final position, so in Modern German we would say:

61) Wie wir bei kommenden Jahren **den Catechismus verabsäumen**

How we by coming years the(Acc.) catechism

Thus, verb particles as well as infinite verbs often occurred in a position following immediately an object noun. The adjacency of the noun favoured reanalysis as we will see in the further discussion.

5.3.4. Reanalysis of infinite verb elements into postpositions

As we have seen in Middle High German, infinite verb elements often preceded the object as NPs and prepositional phrases often followed the verb. It is interesting that when New High German fixed its word order in such a way that infinite verb elements always had to appear in sentence-final position and word order in subordinate clauses got fixed to a basic SOV-order, some postpositions developed (Lehman (1971)). In the same time verb particles, which are infinite verb elements, could only occur in a position after the noun. Particles that govern nouns, thus adpositions, are often homonymous with verb particles in Modern German. Thus, early New High German developed a number of particles, which are used as postpositions according to Lehmann (1971), such as: *entgegen, entlang, gegenüber, gemäß, halber, nach, wegen, zufolge, zuwider* and others

which are less consistently postpositional. These particles can be used also as prepositions with the exception of *halber* and *zuwider*, which can only be used as postpositions (Duden, 1973). A number of these particles can occur as adpositions, so particles governing nouns, and as well as verb particles, which govern verbs and have thus adverbial value. This is the case for *entgegen*, *entlang*, *gegenüber*, *nach* and *zuwider* as in:

Table: German particles

	Entgegen
Verb Particle	<i>Ich gehe ihm <u>entgegen</u></i> (I go him <u>towards</u> - 'I go towards him') <i>Er ist jemandem <u>entgegen</u> gegangen</i> He has someone <u>towards</u> gone – 'He has gone towards someone' <i>Anmeldungen nimmt die Volkshochschule <u>entgegen</u></i> Enrolments takes the adult college <u>towards</u> – 'The adult college accepts Enrolments'
Postposition	<i>Aller Vermutungen <u>entgegen</u> habe ich die Wahrheit gesagt</i> All presumptions <u>opposite</u> have I the truth said – 'Opposite to all presumptions, I have told the truth'.
Preposition	<i><u>Entgegen</u> aller Vermutungen habe ich die Wahrheit gesagt</i> Opposite all presumptions have I the truth said – 'Opposite to all presumptions, I have told the truth'.

	Entlang
Verb Particle	<i>Er geht den Weg <u>entlang</u></i> He goes the way <u>along</u> - 'He goes along the way' <i>Er ist den Weg <u>entlang</u> gegangen</i> He has the way <u>along</u> gone – 'He has gone along the way'
Postposition	<i>Den Weg <u>entlang</u> sehe ich viele Blumen</i> The way <u>along</u> , see I many flowers – 'Along the way, I see many flowers'
Preposition	<i><u>Entlang</u> des Weges sehe ich viele Blumen</i> <u>Along</u> the way see I many flowers – 'Along the way, I see many flowers'

	Gegenüber
Verb	<i>Er sitzt dem Mann <u>gegenüber</u></i> He sits the man <u>opposite</u> – ‘He sits opposite the man’
Particle	<i>Er ist dem Mann <u>gegenübersessen</u></i> He has the man <u>opposite</u> sat – ‘He has sat opposite to the man’
Postposition	<i>Dem Bahnhof <u>gegenüber</u> wartet dein Vater</i> The street <u>opposite</u> waits your father – ‘Your father waits opposite the street’
Preposition	<i><u>Gegenüber</u> dem Bahnhof wartet dein Vater</i>

	Nach
Verb	<i>Der Hund geht dem Mann <u>nach</u></i> The dog goes the man <u>after</u> – ‘The dog follows the man’
Particle	
Postposition	<i>Meiner Meinung <u>nach</u></i> My opinion <u>in</u> – ‘In my opinion’
Preposition	<i><u>Nach</u> meiner Meinung</i> In my opinion – ‘In my opinion’

Table 5.2

We can see in this table that verb particles, postpositions and even prepositions can be homonymous, which also supports the view that postpositions and prepositions got derived from verb particles.

Since verb particles are quite similar to adpositions and often (see above) homonymous, we could see a relationship between the emergence of postpositions and the change of word order. But why exactly did it trigger the emergence of postpositions? For reanalysis to occur, two important conditions are necessary. The first condition is that the elements to be reanalysed are adjacent, the second condition is that reanalysis occurs in main clauses, because learners use syntactic cues in unembedded structures according to Lightfoot (1991). Syntactic cues must be simple, which is the case here since infinite

verb elements do not exhibit an agreement pattern. First we will see the possible effects of increased adjacency, which might have favoured reanalysis:

When German's word order became rigid, we said that non-finite verb elements like participles, infinitives, verb particles had always to occur in a position after the noun in main clauses.

Infinite verb elements such as verb-particles and infinite verbs are separated from the finite verb in main clauses in Modern German as in:

In example 3a), the verb particle is separated from the finite verb

62a) *Er geht den Weg entlang (entlanggehen)*

He goes the way along (to go along)

'He goes along the Way'

In example 3b), the infinite verb is separated from the finite verb

62b) *Er hat das Brot gekauft*

He has the bread bought

'He has bought the bread'

This separation is called the '*Distanzstellung*²⁸', according to Wells (1985). We see that the '*Distanzstellung*' had as an effect that the noun and the particle are adjacent as in the example '*den Weg entlang*'. This adjacency is necessary for processes like grammaticalisation or reanalysis. Di Meola (2000) argues that the NP must be adjacent to the element to be grammaticalised or reanalysed. As Di Meola (2000) points out

prepositions are not inflected as a word class and thus morphologically unchangeable. Adverbs (as well as verb particles) are not inflectable as well and thus the transition from the word class of adverbs towards the word class of prepositions is facilitated. According to Di Meola (2000), the noun that precedes the element to be ‘reanalysed’ must be autonomous and cannot be part of a prepositional phrase. Thus a) cannot be reanalysed but b) can be reanalysed:

63a) *Er geht an der Wand entlang*

He goes at the wall along

63b) *Er geht die Wand entlang*

He goes the wall along

The adjacency of object noun and particle increased with the ‘Distanzstellung’. According to Wells (1985), the ‘Distanzstellung’ was sporadic in Old and Middle High German and increased in the 16th century due to analytic verb morphology and word order. Increased analytic verb morphology means that we have more auxiliary verbs, which were finite and function words, while its lexical main verbs were infinite. Word order had as a subsequent effect that both finite and infinite got separated in main clauses, what we call ‘Distanzstellung’. The second condition is that these elements occur in main clauses. Since the ‘Distanzstellung’ became obligatory in main clauses people might have reanalysed some infinite verb elements such as verb particles and infinite verbs occurring after the noun as postpositions. Also Lehmann (1971) observed that postpositions occurred when word order was fixed in German, and “with the fixing of subordinating word order in which verbs are final, German has introduced a

²⁸ In the English-speaking literature it is usually called verb separation

remarkable number of SOV characteristics". Actually, German had already SOV-characteristic in earlier stages, but it was not linked to a particular clause structure.

Another factor that favours reanalysis and grammaticalisation is that the element to be reanalysed or grammaticalised has synonyms. Thus *gegenüber* has as synonym *vor* and *entgegen* can be replaced by *wider*.

It is striking that spatial adverbs such as *entlang*, *gegenüber* and *entgegen* are often reanalysed. It does not seem to be the case that non-spatial adverbs cannot be reanalysed as adpositions. *Entgegen*, as we will see later, started off as an adverb expressing spatial relationships and as such it could only occur with verbs expressing movement, but its usage got widened in such a way that it also could be used with verbs that do not express movement. Such verb particles got also reanalysed as adpositions. But, on the other side, it is not always the case that spatial meanings got widened in such a way that it can be used in a non spatial relationship. For example, *entlang* was grammaticalised in the sense that it passed from a verb particle to a postpositions and then to a preposition and still it only has spatial meaning.

Since verb particles are usually synonymous and a few of them spatial, but all of them can occur after a noun and do not have an agreement pattern, I postulate the hypothesis that verb-particles, which govern verbs, was one trigger for the emergence of postpositions (noun-governing particles) in German. Other infinite verb elements might also be reanalysed into postpositions such as infinite verbs. Infinite verbs do occur in the same position as verb particles and do not have an agreement pattern either. Participles are especially often reanalysed, such as *entsprechend* (concerning).

Already in the past, grammatical elements associated with verbs gave birth to prepositions. Lockwood (1968) pointed out that prepositions govern nouns, but:

‘This was not however, originally so, as may be deduced from the fact that the prepositions (at least the oldest of them, the primary prepositions) were originally adverbs of place. Thus, by their nature, they were primarily associated with verbs, not with nouns. A tendency to put the adverb immediately before the verb, in this way to define it more precisely, was the first step towards the formation of compound verbs. At the same time, adverbs placed next to the noun governed by the verb served to emphasize the former; eventually they came to be associated with the noun rather than with the verb and so the new category of prepositions arose’.

Also Wells (1985) pointed out the relationship between adverbs and adpositions:

Prepositions originate as markers inserted into the utterance to clarify the relations between the verb and other parts of the predicate (...). Consequently, prepositions have affinities with adverbs, and modern German has homonymous prepositional / adverbial morphemes: *an, auf, aus* etc.

Sometimes the borderline between postpositions and verb-particles is quite close, as Lockwood (1968) demonstrates it:

In Germanic, the dividing line between preverb, preposition and original adverb generally remained fairly fluid, more so than in Latin. Consider the use of *bei* as an adverb, a preverb and a preposition, as exemplified in those sentences: *er steht bei* ‘he stands by’, *er steht ihm bei* ‘he stands by him’, i.e. ‘he supports him’, *er steht bei ihm*, ‘he stands by him’, i.e. ‘he stands near him’.

According to Paul (1968), the adverb gave birth to both prepositions and verb-particles, which often are adverbial themselves. If the adverb got closer connected to the verb, separable and unseparable preverbs developed and if it got closer connected to the noun phrase, then prepositions developed.

Paul says that the borderline between preposition and adverb is not clear cut and that at any time adverbs could get close to prepositions and totally merge into prepositions.

Also, according to Di Meola (2000), the borderline between adposition and non-adposition is not clear cut and is on a continuum of grammaticalisation. In very advanced cases of grammaticalised items, the item lost all of its original meaning as it is the case of 'wegen', where the original meaning of 'way' is not present anymore, and others more recently grammaticalised and less grammaticalised as 'in folge', where 'folge' is still semantically accessible as the word meaning 'the following'. On a more functional level, some items such as 'entgegen' can be prepositions, postpositions and adverbs.

According to the Duden-Grammatik (1973), verb-particles developed out of adverbs, adjectives and nouns. Adverbs seem to be the primary source for verb particles, which is not surprising since verb particles act as adverbs themselves, but somehow they can be close to adpositions as in: *Ich gehe den Weg entlang* (I go the way along), where 'along', due to its adjacency to the noun, can be easily interpreted as an adposition (so along is in relation to the noun), what must have happened in German since it can be used as a postposition. But it can also be seen as an adverb which defines the movement 'to go along', and then it has to be a verb particle.

In the next subsection, we will see how some postpositions developed; we will see that quite a few particles developed from an adverbial verb particle towards a postposition.

Later on, we will discuss how we could explain this development in theory.

5.3.5. A look at some particles' etymology

Taking over the examples of Lehmann (1971), which are according to him, those adpositions who had the clearest development to postpositions, we will see that these particles developed from adverbials or verb particles (which are adverbial themselves), and once they were used in a recursive rule set their postpositional use diminished and were then generally preposed.

Entlang

Entlang, for example, has its origin in the Middle Low German prepositional phrase *in lanc*, which had adverbial value. According to Kluge (1967), this phrase comes from Low German, *dem mere in lanc* ('the sea in length'). Since prepositional phrases occur after NPs (NP -> (NP (PP))), we can easily see how at a time when all verb-particles had to appear after the NP (object, PP), an adverbial phrase as *in lanc* can be reanalysed into a verb-particle, which itself is adverbial. But then this verb-particle got also used as an adposition, both as a preposition and a postposition. According to Lehmann (1971), first postpositional usage developed. Data from di Meola (2000) also suggest that first postpositional usage developed. In her corpus of elder texts, only 13% of occurrences of this adposition are prepositional, while 68% are prepositional in the modern corpus.

According to Lockwood (1968), "'along' was best expressed in the oldest language by *after*." In Old High German, we had thus: *man gieng after wege*, which means: 'a man walked along a road'. Here we can see that *after* is a preposition and it is not a verb particle as we would have it in Modern German. Lockwood (1968) explains the developing of the particle 'along' (*entlang*) in the following way:

Later on, adverbs based on *lang* 'long' developed into prepositions, like English 'along'. The first is the MHG adverb *langes, lenges* 'along' > NHG *längs*, which remains the adverbial sense until the eighteenth century, but afterwards occurs only as a preposition, usually with the dative: *Bäume wachsen längs dem Wege*. An other adverb of Low German Provenance appeared. The word *entlang* has commonly retained its adverbial function to the present day, but it has also become a preposition (or postposition).

According to Paul (1968) *entlang* was first an adverbial verb particle and developed only later on to a preposition.

To summarize *entlang* was first used as a verb particle, which became an adposition. First it was used predominantly postpositional, but then also prepositional usage occurred and increased in frequency. So, we see here that an adposition developed from an adverbial verb particle to a postposition and that such an adposition became relatively fast a preposition, so adapted to the German prototype.

Entgegen

According to Kluge (1967), *entgegen* is an adverbial, which can be used as such as a verb particle. Until 1740 the particle *entgegen* was restricted to verbs with motion such as *entgegengehen* ('to walk towards') or *entgegenlaufen* ('to run towards'). Later on, then this usage was enlarged to verbs, which express 'a certain kind of readiness of psychic reception'²⁹ such as *entgegenjauchzen* ('shout with joy towards'), *entgegenlächeln* ('smile towards'), *sich entgegensehnen* ('long for towards').

²⁹ The expression Kluge (1967) uses is *seelische Empfangsbereitschaft*.

According to Grimm (1862), *entgegen* is more frequent as an adverb, which often has the function of a verb particle. Sometimes, according to Grimm (1862), it is difficult to decide if *entgegen* acts as an adverb or as an adposition:

Verschiedentlich mag zweifel walten, ob *entgegen* als adverb dem verbum anzuschliessen oder als unabhängige praeposition mit ihrem casus davon zu sondern sei, z.b. in der stelle: *Mose füret das volk aus dem lager Gott entgegen*, im letzten fall wird der dat. Gott von *entgegen*, im ersten von entgegenführen regiert. der sinn unterscheidet sich kaum.

Sometimes there might be doubt if *entgegen* should be an adverb that governs the verb or should be seen as an independent preposition with its relevant case. For example, in: *Mose füret das volk aus dem lager Gott entgegen* (Moses brought the people out of the camp to meet God), in the last case the dative 'Gott' is governed by *entgegen*, in the first case it is governed by the verb 'entgegenführen'. The sense hardly differs.

So, in *Mose füret das volk aus dem lager Gott entgegen* ('Moses brought the people out of the camp to meet God'³⁰), it is difficult to decide according to Grimm (1862) if *entgegen* is joined as an adverb to the verb or as an independent adposition. The sense of the phrase is not very different according to Grimm (1862).

Entgegen was first used postpositionally according to Lehmann (1971). Again, data from di Meola (2000) seem strongly to indicate this. In older texts, 4% of this adposition is used prepositionally, while in modern texts prepositional occurrence is at 45%.

To summarize, such as *entlang*, *entgegen* as an adposition developed from a verb particle. *Entgegen* could be initially only used with verbs of motion, but later on its usage got enlarged and it could also be used with verbs expressing a certain kind of

‘psychic reception’. We know from processes of grammaticalisation, that when an element gets more grammaticalised, its semantic occurrence gets broader.

Such as *entgegen*, its usage was initially adverbial, but soon adpositional usage occurred. First it got used as a postposition, but as in the case of *entlang*, when prepositional usage occurred, it got more frequent and postpositional usage decreased.

Gegenüber

According to Paul (1968), *gegenüber* was first used adverbial. *Gegenüber* developed out of a fusion of the preposition *gegen* and the adverb *über*, which were divided in two parts: *gegen dem Schloss über* (‘opposite to the castle’). The fusion *gegenüber* was first used adverbial, so Paul, and then only since the eighteenth century the noun was preposed, and the usage of a postposition was established: *der schönen Nymph gegenüber* (‘opposite to the beautiful nymph’). According to Lehmann (1971) and Paul (1968), it first developed as a postposition. The use of a preposition, so Paul, was only recent. According to the data of di Meola (2000), we find 12% of the occurrences are prepositional in the ‘ancient’ corpus, while 73% are prepositional in the modern corpus.

Such as the other particles discussed so far, *gegenüber* started off as a verb particle, and first adpositional usage was postpositional. Prepositional usage occurred recently and its frequency increased rapidly while its postpositional usage decreased.

³⁰ Exodus, chapter 19:17

Gemäß

Gemäß entered the language as an adverb according to Kluge (1967). According to Grimm (1862), *gemäsz* ('according') came from an adjective to *masz* ('measure') and *messen* ('to measure'), but was early used as an adverb: *[.] um dem sittengesetz gemäsz zu handeln.*

According to the data of di Meola (2000), only 5% of the occurrence of this adposition was prepositional in the corpus of elder texts, while in the modern corpus 97% of this adposition are used prepositionally.

We might also conclude here that this adposition emerged from an adverb and that first postpositional usage occurred, but that when prepositions occurred, postpositional usage decreased.

Zuwider

Zuwider comes from Middle Low German *toweddern* and penetrates the language in the 16th century as an adverbial according to Kluge (1967). The development of a predicative adjective is recent: "*Er ist uns zuwider*" ('He is repugnant to us' – We find him repugnant). The use of an attributive adjective is regional such as "*ein zuwiderer Kerl*³¹" ('a repugnant guy).

We can see *zuwider* also originates from an adverbial.

Halber

The postposition *halber* comes from a noun *halbe* ('from side'). According to Grimm (1862), *halber* is an adjective and an adverb. Already in the Middle Ages, so Grimm (1862), adverbial and adpositional usage occurred. See the following phrases as an example for adverbial use (Grimm (1862)): *Als ihn der König halber todtwund* (when the king killed him 'nearly' (half)), *Ir leidt und jamer möcht einer net halber erzelen* (Her pain and misery would like one not half tell – 'One would not like to tell half of her pain and misery'). In Middle High German, prepositions developed with the combination of *halp* such as *(inner)halp* (inside), *ûzerhalp* (outside), *oberhalp* (upside), *niderhalp* (downside). Till the 18th century the dative plural form *halben* was used in constructions such as: *dieser Hoffnung halben* ('because of this hope'). This usage of *halben* survived till the 18th century. In the 15th century *halber* occurred, which in the modern language replaced totally *halben*.

To summarize *halber* first developed as an adverbial. It can only be used postpositionally. So, this seems to be a counterexample of the general development towards prepositional usage. But there are some peculiarities about this adposition. First, it cannot be used in a recursive rule set, i.e. an adpositional phrase of which *halber* is the head as the adposition cannot be center-embedded in a NP (NP -> NP (PP)), while other postpositions can be center-embedded such as 'entgegen' and 'entlang'. So, its usage is syntactically restrained. Second, it is a kind of unusual adposition, which sounds archaic and is not very frequent and belongs rather to the written than to the spoken language.

³¹ Compare English cognate 'churl'

Nach

Nach is according to Grimm (1862) an adverb and a preposition. It comes from an Old High German adjective *nâh*, which means ‘close’. *Nach* is often used as a verb particle such as *nachdenken* (to think about), *nachgehen* (to follow). It can be used elliptically in such a way that a verb of motion is omitted:

- 64) *Ich will ihm nach*
I want him close
‘I want to follow him’

According To Paul, *nach* can be also used as a postposition as in: *seinem Befehl nach* (according to his command) or *Der Nase nach* (follow the nose), where in the latter according to Paul the influence of *nachgehen* (follow) might be of importance.

Nach can be a verb particle and some postpositional usages developed out of this usage such as ‘*der Nase nach*’, which might have developed out of elliptical usages.

Wegen

Wegen never was a proper adverb in the history of German, which makes its history a bit different from the other adpositions discussed so far. *Wegen* derives from a noun, which meant in Old High German, something as ‘side’, ‘way’. It used to occur especially in genitive constructions. Since the Old High German genitive phrase was head-last, *wegen* was preceded by a genitive. See for this also Grimm (1862):

“der gen. eines subst., wird anfangs fast ausschliesslich vor wegen gestellt.”

[the genitive of a noun was initially fronted nearly exclusively in front of *wegen*].

In Middle High German, *wegen* still had the meaning of ‘side’: *An beider wegene* (on both sides), but *wegen* got more and more grammaticalised in the German language history. The meaning of ‘side’ got lost soon, and *wegen* developed more and more to a function word, thus that we speak of bleaching of semantic meaning. In the thirteenth century, *wegen* occurred in the combination with a preposition *von*. *Von ... wegen*. *Wegen* was still preceded by a genitive phrase and *wegen* was still felt like a dative plural (see Grimm (1862)). Only later on, in the fifteenth century *wegen* was also followed frequently by a noun as in:

65) *Von wegen des vergossenen Blutes* [because of the shed blood]

According to Grimm (1862), in Luther’s times (15th century) *wegen* usually preceded the noun already. Therefore, the preposition developed at a point when first German’s genitive phrases became more and more right-branched (head-first). So, since structures, as evoked before, were based on genitive structures, we could expect that here the syntactic change of genitive phrases might be responsible. But, still in Modern German there are head-last genitive phrases although they are less frequent and more marked.

But already at this time *wegen* seemed to have lost its lexical content and must be rather seen as a function word. So, we cannot expect that people still analysed it as a genitive phrase, and that due to the change in the genitive phrase *wegen* was preposed.

Till the 17th century, the postposed structure '*von N (Gen.) wegen*' was possible and coexisted with the preposed structure '*von wegen N (Gen.)*'. But this postposed structure got less and less frequent and now, according to Grimm (1826), this structure is only possible in some fixed expressions as for example *von Rechts wegen* ('because of the law'). But despite these few exceptions, according to Grimm (1826), the genitive follows *von wegen*.

From the end of the 16th century on, *wegen* also occurred without *von*, and could be pre- or postposed as it was the case for *wegen* with the combination of *von* as in (see Grimm (1826)):

66) *Armut's wegen* ('because of poverty')

67) *wegen des bösen teutsch* ('because of the evil German').

In the 17th century, *wegen* as well as *von wegen* (while postposition of *wegen* is still possible) coexist. The frequency of '*wegen* without *von*' increases in the following.

According to Grimm (1862), *wegen* and *von wegen* get more and more preposed in the usual language. In the same time, according to Grimm (1862), they get under the influence of the old prepositions and therefore the dative is more and more required after (*von*) *wegen* N (dat.). The tendency of preposing *wegen* can also be found in pronouns. Beside '*weswegen*' (earlier: *wes wegen*), a preposed variant *wegen was* developed in the popular language according to Grimm (1862). Other examples are *meinetwegen*, which had as a variant *wegen mir*, *ihretwegen*, which had as a variant *wegen ihrer*, *deinetwegen* which had a variant *wegen deiner*.

To summarize, Lehmann (1971) discusses *wegen*, and argues that its postpositional usage increased but as we have seen at the time (16th century), when Lehmann claims

that German introduces postpositions, *wegen* already developed towards a preposition. This adposition is different in the sense that it was not used adverbially, and that it got grammaticalised from a genitive phrase, which used to be head-last. When *wegen* got grammaticalised and lost its semantic content it could also be preposed like other adpositions in German.

5.3.6. General conclusion of presented postpositions

Now we have presented all the adpositions that Lehmann (1971) presented. All these adpositions discussed by Lehmann with the exception of *wegen* (1971) were used adverbial before they got postposed as adpositions. There is also a tendency of preposing, although the tendency of preposing is more recent. *Gegenüber* developed only recently to a preposition, *entlang* also developed first to a postposition and only later on to a preposition, *entgegen* is rather rare as a postposition today. The fact that at this time the 'Distanzstellung' became more and more obligatory and consequently noun and particle were systematically adjacent might have favoured the reanalysis of these adverbials into adpositions at the same approximate time.

So it seems that the diachronic development from an adverb (verb particle) via postposition towards a preposition is the following:

Adverbial (verb particle) -> Postpositional adposition -> Preposition

The Duden grammar (1973) also notes that some particles are not adverbs anymore, but prepositions. Others are mainly used as prepositions and only in a restricted way used as adverbs. Others are used equally as adverb and preposition:

Bestimmte dieser Partikeln sind heute nicht mehr Adverb, sondern Präposition (z. B. *binnen*). Andere werden vornehmlich als Präposition und nur noch beschränkt als Adverb gebraucht (z. B. *an, bei, bis, über*). Wieder andere Partikeln werden als Adverb und auch als Präposition gebraucht (z.B. *abseits, ausserhalb, diesseits, jenseits, entlang, inmitten, oberhalb, unterhalb, unfern, unweit, längs, anfangs, ausgangs, eingangs*).

[Certain of these particles are not adverbs anymore nowadays, but preposition (for example *binnen*). Others are predominantly used as prepositions and only in a restricted use as adverb (for example ‘*an, bei, bis, über*’). Again other particles are used as adverbs as well as prepositions (for example ‘*abseits, ausserhalb, diesseits, jenseits, entlang, inmitten, oberhalb, unterhalb, unfern, unweit, längs, anfangs, ausgangs, eingangs*’).]

We have seen throughout the examples that elements that are governed by verbs such as verb particles and adverbs can be reanalysed as particles that govern nouns.

5.4. Transparent vs Idiomatic Particle Verb Combinations (PVC)

Not all verb particles can be reanalysed into postpositions and then hence to prepositions. Wurmbrand (2000) distinguishes between two kinds of particle verb combinations (PVC): Transparent PVC and (Semi-) Idiomatic PVCs. Transparent PVCs can contrast its particles while (Semi-)Idiomatic ones cannot:

68) Contrastive particles

hinauf	'up'	}	führen, schicken, gehen, kommen, (lead, send, go, come)
hinunter	'down'		
hinüber	'to the other side'		
hinein	'in'		
hinaus	'out'		
zurück	'back'		
weg	'away'		

Idiomatic PVCs are composed uniquely and particles cannot be contrasted such as in:

aufführen – 'to perform', aufessen 'to eat up'; hinauswerfen - 'to fire'

Thus, for example 'hinauswerfen' (literally 'out throw', which means 'to fire someone') cannot be contrasted with hineinwerfen ('in throw') for saying 'to employ'.

So, particles in idiomatic PVCs cannot be contrasted. They can only take one particle.

The verb particles that had a development towards adpositions occurred in transparent PVCs. So *entlang* for example occurs with verbs of movement and *entlang* (along) can be contrasted with all the particles as we have seen above in our example for transparent PVCs. The same for *entgegen*, which can be used in constructions such as *entgegenlaufen* and can be contrasted with *entlang* and other particles. *Nach* can also be contrasted. A construction such as *nachlaufen* (to follow) could be contrasted with *hinunterlaufen* (to go down) and others. Older adpositions such as *halber* were used as verb particles such as in: *Ir leidt und jamer möcht einer net halber erzelen* (Her pain

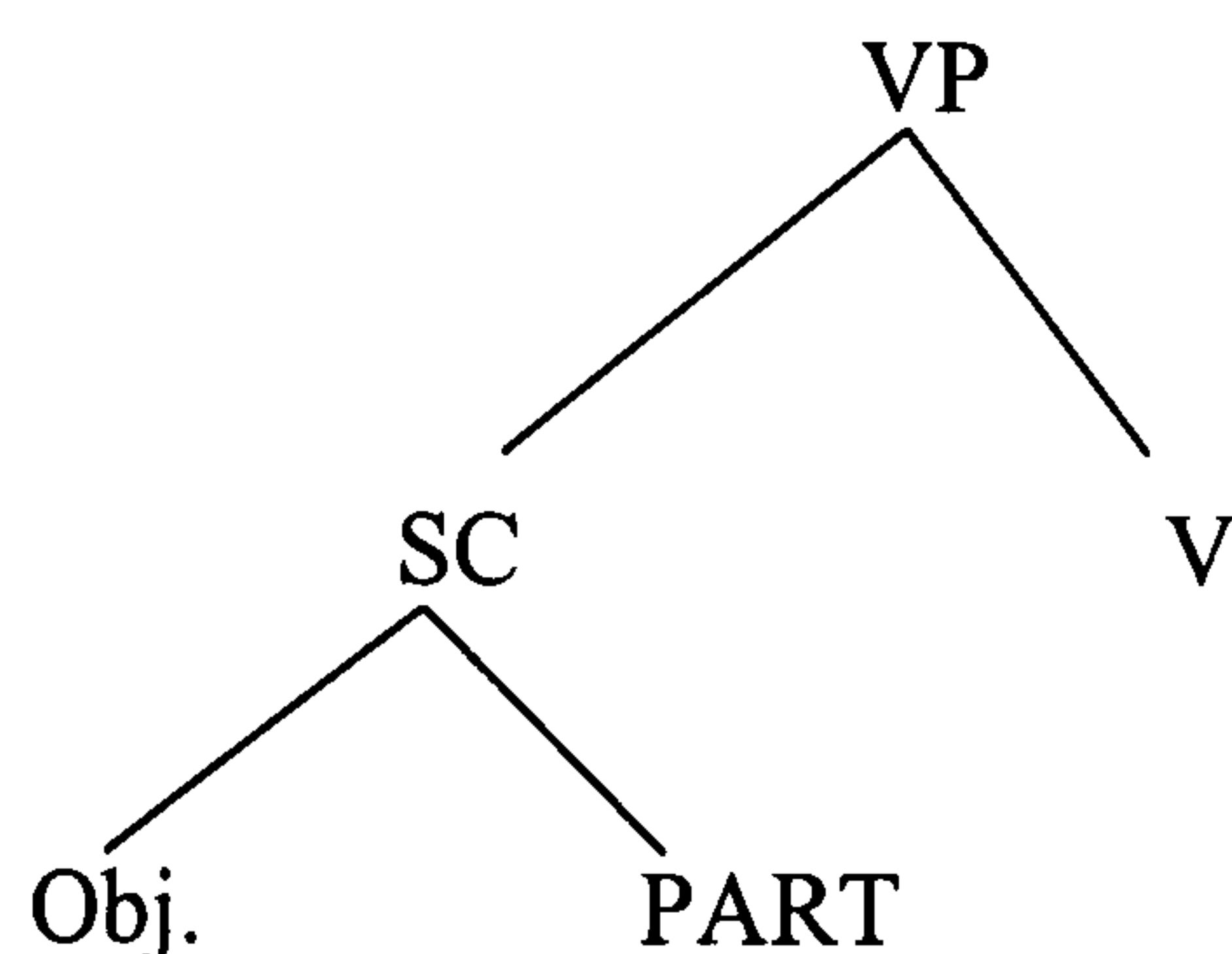
and misery would like one not half tell –‘One would not like to tell half of her pain and misery’. It does not seem to be an idiomatic construction and we can easily imagine it to be replaced by *völlig* (full, entire complete).

So, we assume that verb particles, which can be reanalysed to postpositions, must be transparent PVCs. This is also a point of view similar to the one of Di Meola (2000) who claims that a particle must have a synonymous one for being able to be grammaticalised.

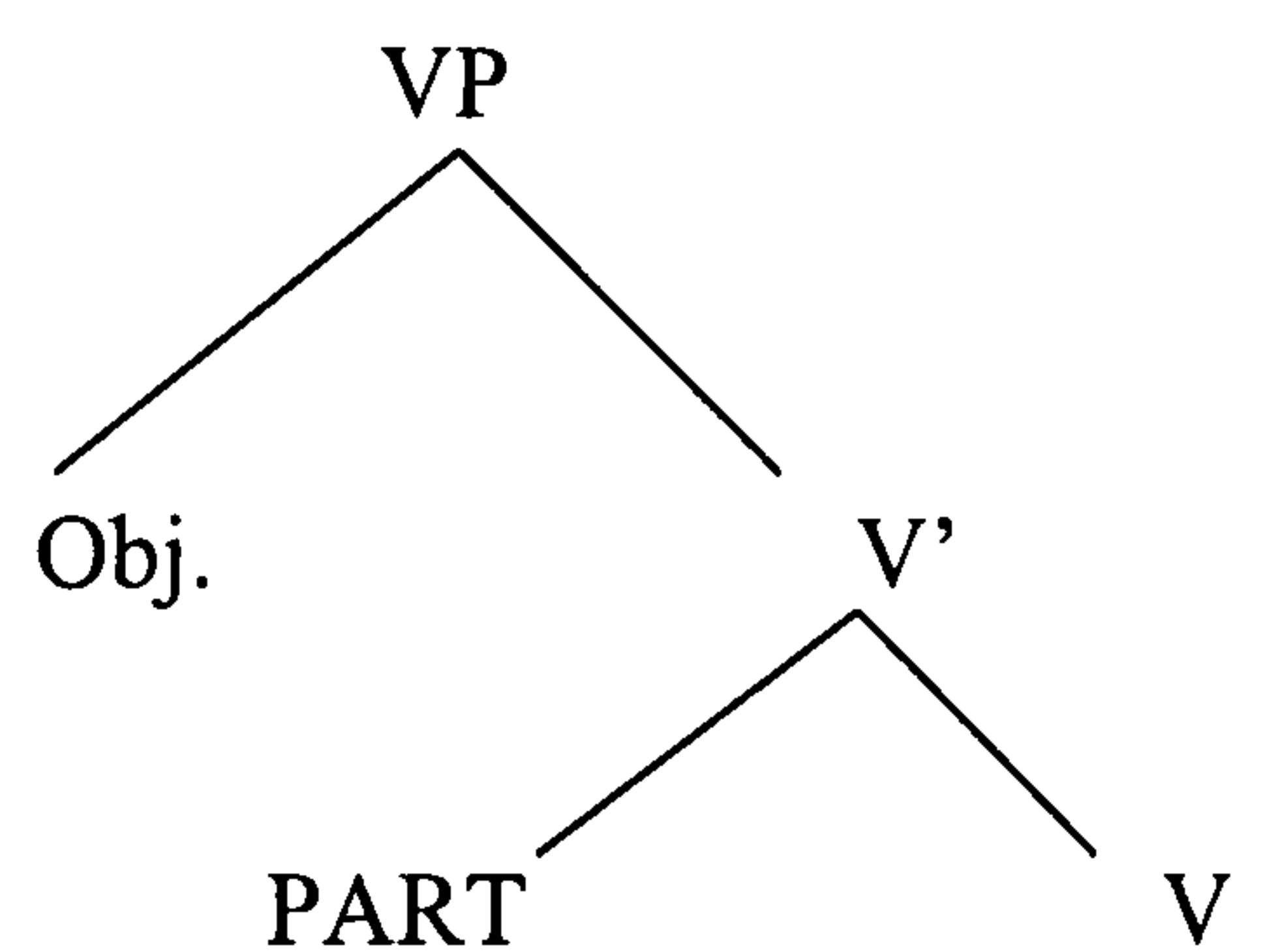
According to Wurmbrand (2000), transparent PVCs are licensed as small clause predicates, while idiomatic PVCs are represented by a complex V'-structure.

Let us see both structures in the following:

69) Transparent PVCs

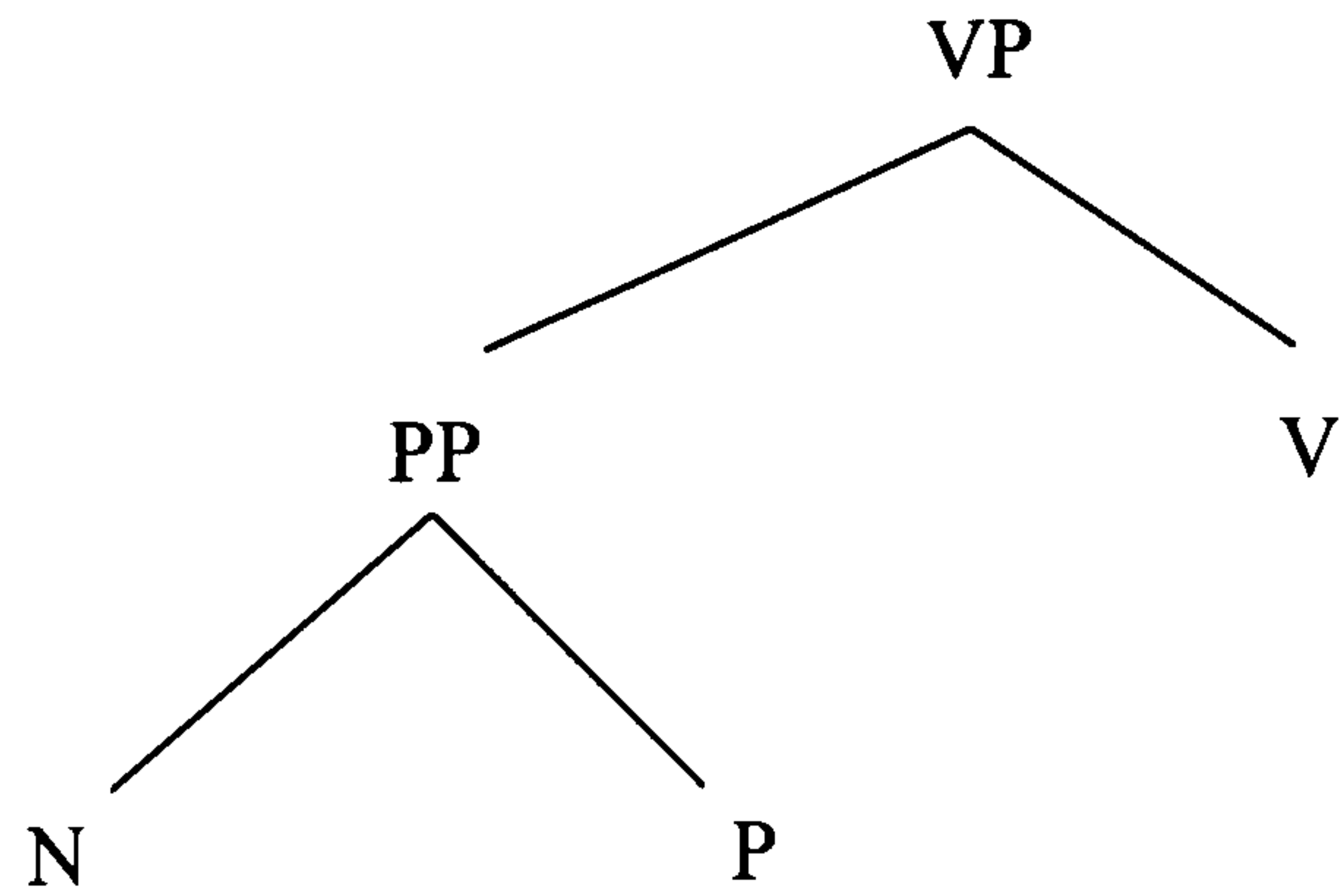


Idiomatic PVCs



If we compare the branching of the transparent PVC with the one of postpositions (11), we see that we have the same structure, the small clause in the transparent PVC has the same structure as the postpositional phrase in a VP, and both are complements to the verb phrase:

70)



Transparent particles are in a small clause structure for the following reasons:

As already mentioned the particles can be contrasted. Verb particles in a transparent PVC can be fronted. Let us see the following example:

71) *Er macht die Tür auf*

(He makes the door **open** – ‘He opens the door’)

72) *Er schickt den Brief weg*

(He sends the letter **away** – ‘He sends the letter’)

The particle *auf* and *weg* can be fronted

73a) ***Auf** macht er die Tür*

73b) ***Weg** schickt er den Brief*

Particles in an idiomatic PVC cannot be fronted:

74a) *Er isst die Suppe auf*

(He eats up the soup)

74b) **Auf isst er die Suppe*

Although the particle can be fronted in a transparent PVC, not the whole small clause structure can be fronted:

75a) *Er macht die Tür auf*

75b) *Auf macht er die Tür*

75c) *Er schickt den Brief weg*

75d) *Weg schickt er den Brief*

but not:

75e) **Die Tür auf macht er*

75f) **Den Brief weg schickt er*

But then consider:

76a) *Er geht den Weg entlang* (He goes the way along – ‘He goes along the way’)

76b) *Entlang geht er den Weg*

and also acceptable is:

76c) *Den Weg entlang geht er*

In this latter case we must have an adpositional phrase, since it is acceptable to front the whole 'small clause'. According to a study of Zeller (2003), German speakers find it more acceptable to front prepositional phrases than verb particles. So, a prepositional phrase such as in 19a) can be fronted such as we can see in 19b):

77a) *Er geht mit dem Hund spazieren* (He goes with the dog walk – 'He walks with
the dog)

77b) *Mit dem Hund geht er spazieren.*

If this is similar for postpositional phrases, we should not be surprised that postpositions can arise since fronting of the whole small clause structure if adpositional should be more acceptable than the fronting of verb particles.

In example 76), we could still argue that *entlang* could still be a verb particle. So, if we replace it by another verb of which *entlang* cannot be a verb-particle, then we see that postpositional fronting is still possible:

78) *Den Weg entlang sieht er Blumen.*

We have seen that only verb particles in a transparent PVC can be reanalysed. We also have seen that there is evidence that they can only be fronted with a preceding object when they have properties as adpositions, which might be the first step towards total integration in the adpositional rule system.

In the following we will see that once they occur in a recursive rule set, they tend strongly to occur as prepositions, and more and more they also occur as prepositions outside recursive rule sets.

5.5. The Recursive Rule Set in German

In the following, we will discuss the recursive rule set, since it has an important impact on if the language parses pre- or postpositions. Head-first languages parse prepositions and head-last languages parse postpositions. Inconsistencies in recursive rule sets result in center-embeddings (cf. Christiansen and Devlin (1997)).

In the following, we have to investigate if there are consistent head-last and / or head-first consistent rule sets. In both possible recursive sets, head-first and head-last, we would have the following surface structure: 'NP P NP'. In a head-first structure (prepositions) the NP is analysed as NP -> [NP (P NP)] and in a head-last structure (postpositions) the NP is analysed as NP -> [(NP P) NP]. So how do we know if postpositions can occur in a consistent recursive rule set in German since most adpositions that can be postposed can also be preposed in German? Adpositions determine the case of the noun governed by it. If *entlang* follows the noun, the noun governed by this adposition has to be in the accusative or occasionally in the dative. If *entlang* precedes the noun, then it will be usually in the dative, sometimes in the

genitive. Often, it is not clear if we have a preposition or a postposition in a sentence such as in: 'The forest along the brook' since we could also have 'The brook along the forest'. So in German we could read a sentence 'The forest [along the brook] if we have a preposition, but if postpositions are possible in such a recursive set, we could read such a sentence as '[The forest along] the brook, which would mean 'The brook along the forest'. But as we have seen before, the noun that is governed by the adposition *entlang* takes a certain case-marker, but never the nominative case. So, if the head noun is the subject of the phrase, it is in the nominative case. So then we know which noun is the head noun and which noun takes the case marking.

So, we can say:

79) *Der Wald entlang des Baches / dem Bach ist wunderschön.*

The forest (Nom.) [along the brook (Gen. / Dat.)] is beautiful.

'The forest along the brook is beautiful.'

NP **PP**

80) *Der Bach entlang des Waldes / dem Wald ist wunderschön.*

The brook (Nom.) [along the forest] is romantic.

'The brook along the forest is romantic.'

NP **PP**

But we cannot have a postposition in the sense that a noun, which is not in the nominative precedes the adposition. Remember that the noun that follows the adposition takes the accusative or the dative.

81) **Den Bach/ dem Bach entlang der Wald ist wunderschön.*

[The brook (Acc. / Dat.) along] the forest is beautiful.

PP NP

82) **Den Wald/ dem Wald entlang der Bach ist wunderschön.*

[The forest (Acc. / Dat.) along] the brook is beautiful.

PP NP

What all recursive rule sets have in common is that the noun is always head first. The head-last adpositional phrase is probably transferred from another syntactic environment like verb particles and if this structure is used consistently as an adposition it is usually used as a preposition.

Recursive Rule Sets with postpositions

When an adverbial particle develops into a postposition in German, it might have the tendency to be postpositional since verb-particles occur in a position after the noun. But soon it becomes a preposition, since German's noun phrases in a recursive rule set have the tendency of being head-first. Now let us consider how consistent recursive rule sets look like. We have two options, one for a head-first language and one for a head-last language.

Recursive rule set for head-first languages (a) and head-last languages (b):

83)

a)

A -> [a (B)]

B -> [b A]

b)

A -> [(B) a]

B -> [A b]

The small letters represent the head and the capital letters are complements. Thus we can see that in a), where we have a recursive rule set for head-first structures, the head precedes the complement, while in b), where we have a head-last structure the head follows the complement. B is an embedded structure. B must then follow the same head-ordering than A. Thus if A is head-first as it is the case in example a), then the embedded structure B must be also head-first. In example b), it is the other way round, A is head-last, and the embedded structure B, must then also be head-last.

Now, let us assume for a) that a PP is B and that a NP is A, so b is a preposition and a is a noun.

84)

NP -> [N (PP)]

PP -> [pre NP]

For postpositions we would then likewise assume that a PP is B and that a NP is A, so b is a postposition and a is a noun :

85)

NP -> [(PP) N]

PP -> [NP **post**]

Here, we have seen the two consistent rule sets and now we will see how an inconsistent recursive rule set might have developed. Remember that we said that verb particles in transparent constructions can be fronted and that the first step towards the emergence of postpositions would be that the preceding object can be also fronted when we have a postpositional phrase. This is also the case when two nouns precede the particle. So let us consider an unmarked sentence such as:

86) *Das Wasser fließt nur wenige Meter den Graben entlang*

The water flows only few meters the ditch along

‘The water flows only a few meters along the ditch’

Here, we have a phenomenon that we call, as already mentioned before, verb separation. The verb particle ‘*entlang*’ is separated from the verb ‘*fließen*’. The infinitive is ‘*entlangfließen*’. Consider further the note X. We have seen that the verb particle can be fronted when it occurs in transparent constructions. Further, we have seen that in some instances, the noun can be fronted and here we see that even both nouns can be fronted.

87) *Nur wenige Meter den Graben entlang fließt das Wasser.*

The water flows only few meters the ditch along

The water flows only a few meters along the ditch

But here, *entlang* is not a postposition, but a verb particle. But not all verb particles can be fronted with preceding nouns, and especially those that had a development towards postpositions, as we argued before, allow these kinds of fronting. For being sure that this is a step closer to the development towards postpositions, we have to find a similar structure, but where the particle cannot be a particle attributed to the verb:

88) *'Sie finden eine Tankstelle nur wenige Meter die Strasse entlang'*

You find a garage **only a few meters the street along**

'You find a garage only a few meters along the street'

The particle '*entlang*' is not governed by the verb '*finden*'. A structure such as '*entlangfinden*' does not exist. So we can be rather sure that we deal here with an adposition.

As we will see in the following we are able to front both nouns and thus we get:

89) **Nur wenige Meter die Strasse entlang** *finden Sie eine Tankstelle*

Only a few meters the street along find you a garage

'Only a few meters along the street, you find a garage'

Now let us consider an extension to the previous examples in the sense that we take two particles into account, so that we can create a recursive rule set in the following:

The unmarked sentence would then be the following:

90) Der Sportler läuft den Weg der Eisenbahnlinie entlang der Stadt entgegen

The sportsman runs the way the railway line along the town towards

‘The sportsman runs along the railway line towards the town’.

As previously, we can front the particles with the corresponding nouns:

91) Den Weg der Eisenbahnlinie entlang der Stadt entgegen läuft der Sportler

The way the railway line along the town towards runs the sportsman

‘The sportsman runs along the railway line towards the town’

As we argued before, *entlang* and *entgegen* are governed by the verbs and are thus verb particles and not postpositions. As before, we have to find a similar structure, but where the particles cannot be attributed to the verb.

92) Den Weg der Eisenbahnlinie entlang der Stadt entgegen finden Sie eine Hütte

The way the railway line along the town towards find you a shelter.

‘You find a shelter on the way along the railway line towards the town’

The particle ‘*entlang*’ and ‘*entgegen*’ are not governed by the verb ‘*finden*’. A structure such as ‘*entlangfinden*’ or ‘*entgegenfinden*’ does not exist. So we can be rather sure that we deal here with postpositions. In the example above ‘Weg’ is in the accusative case.

Below we will replicate an example in the nominative:

93) Der Weg der Eisenbahnlinie entlang der Stadt entgegen ist wunderschön

The way the railway line along the town towards is beautiful

‘The way along the railway line towards the town is beautiful’

If we have a recursive rule set with a postpositional phrase then according to the definition we gave about recursive rule sets earlier, the adposition should precede the noun. Let us consider this in the following:

94)

NP -> [N (PP)] A -> [a (B)]

PP -> [pre NP] B -> [b A]

But the adposition follows the noun, so we could postulate the following recursive rule set:

95)

NP -> [N (PP)] A -> [a (B)]

PP -> [NP post] B -> [A b]

Structure A, the NP is head first. Now we would expect that a phrase that is embedded in the NP, would equally be head-first. But B, so the PP, is head-last. To put it in another way, the NP is head-first, and the embedded adpositional phrase would be expected to be a prepositional phrase, but it is a postpositional phrase. But if we apply this rule set, we would expect:

96) *Der Weg der Eisenbahnlinie der Stadt entlang entgegen

This structure is bad because of its centerembeddings. But as we have seen above we do not get this kind of centerembeddings:

97) Der Weg der Eisenbahnlinie entlang der Stadt entgegen

The way the railway along the town towards

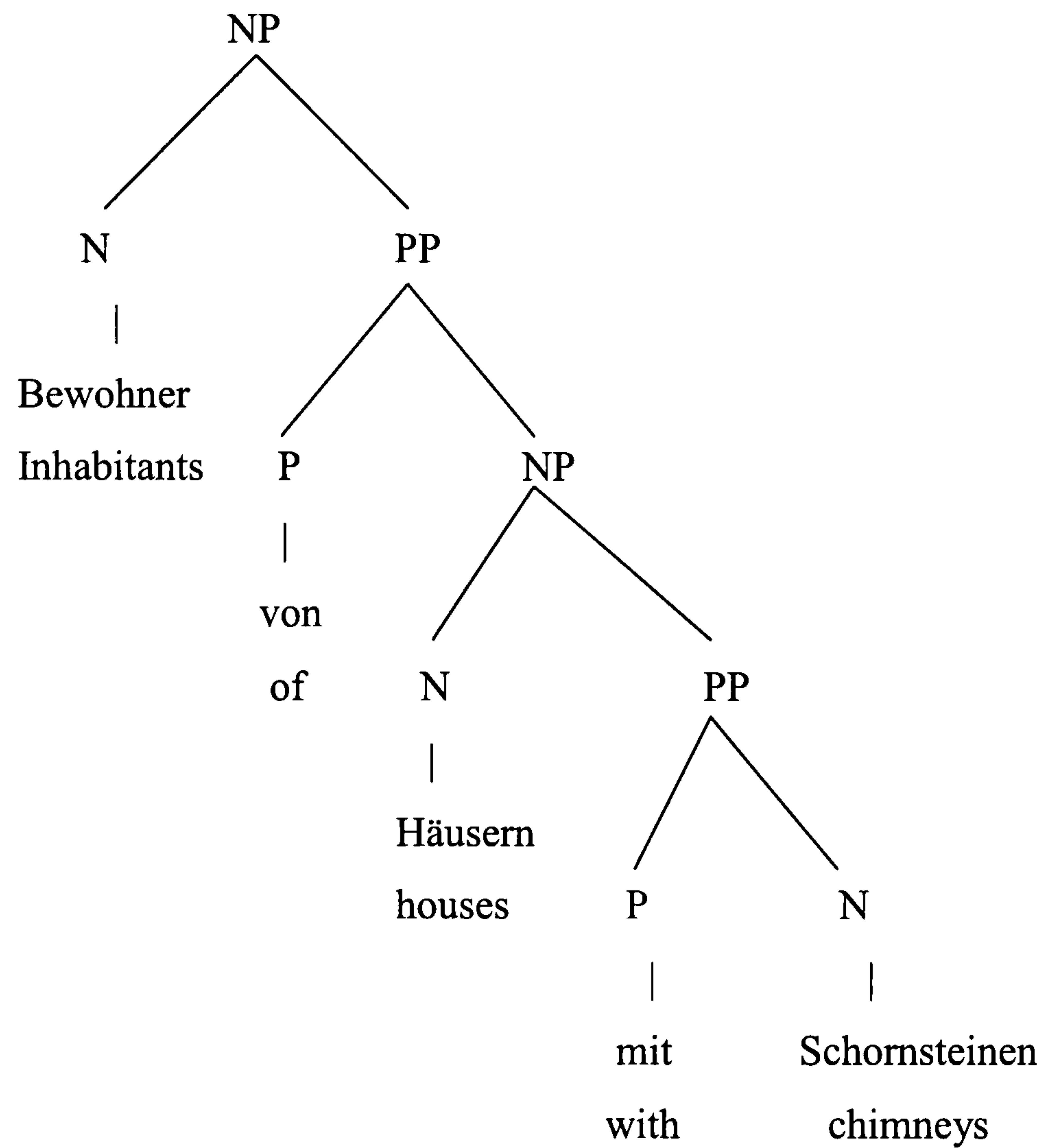
‘The way along the railway towards the town’

So we cannot postulate such a recursive rule set as we did before. But if we observe carefully, we can realise that the postpositional phrases are on the same hierarchical level, which means that they are all directly center-embedded to the noun phrase, but not center-embedded to each other.

For illustrating this, let us take as an example a recursive rule set where we have thus a hierarchical center-embedding and then show why we have in the example above not a hierarchical embedding.

98) Bewohner von Häusern mit Schornsteinen

Inhabitants of houses with chimneys



NP -> (N (PP)) A -> (a (B))

PP -> (pre NP) B -> (b A)

In this example, we have a hierarchical relationship. Thus, we cannot change the position of the PPs:

99) *Bewohner mit Schornsteinen von Häusern

This is not the case of example 97, where the adpositional phrases are not center-embedded to each other, but both are on the same hierarchical level and are coordinated.

We can exchange the position of the relevant postpositional phrases

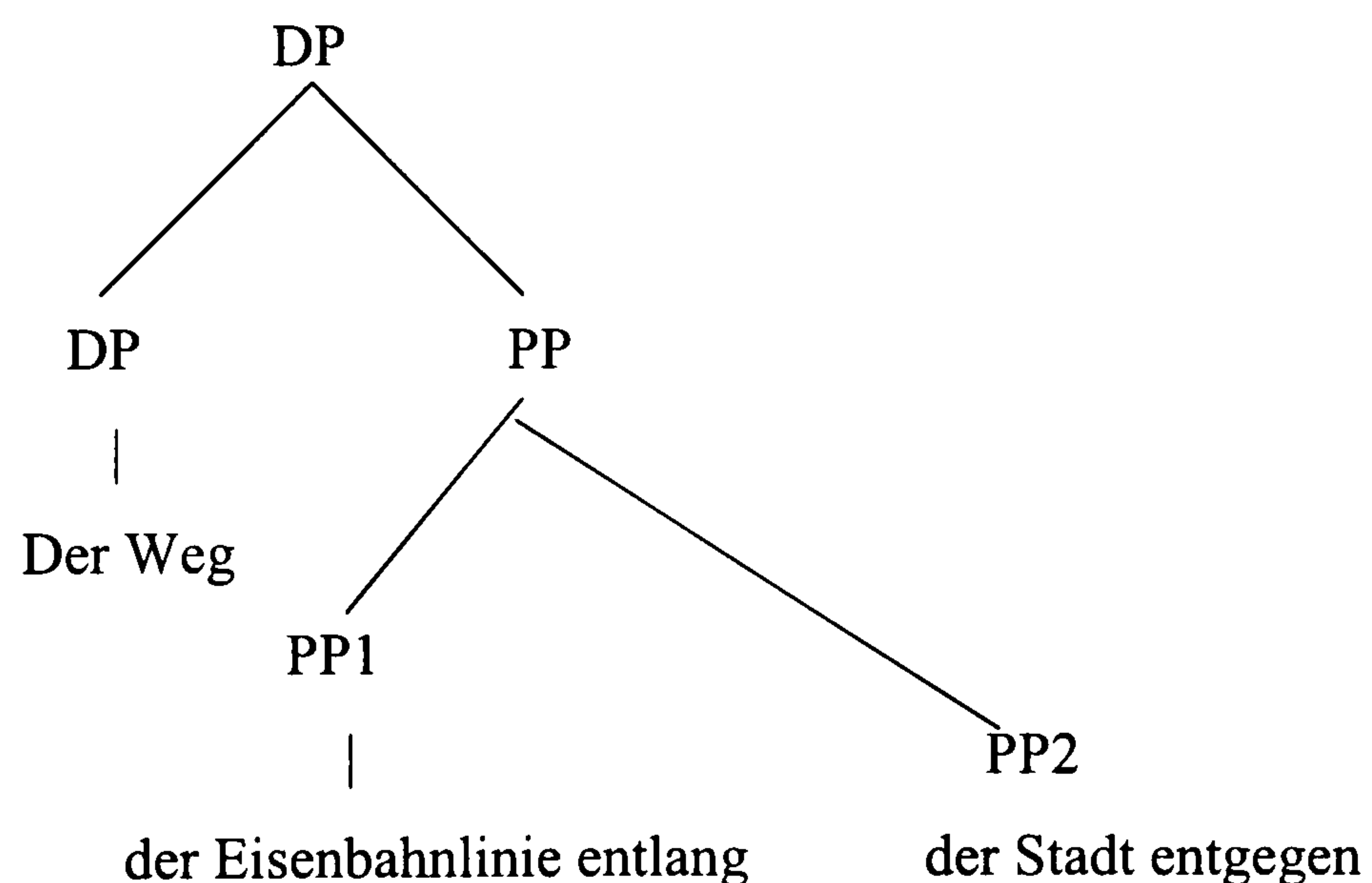
100) Der Weg der Stadt entgegen der Eisenbahnlinie entlang

The way the town towards the railway line along

‘The way towards the town along the railway line’

We can also illustrate this in the following way:

101) DP[Der Weg PP1[der Eisenbahnlinie entlang] PP2[der Stadt entgegen]]



We have we have to point out that these structures are extremely rare and that prepositions are usually parsed in these constructions. We can expect that this structure puts pressure on the adpositions and that for this reason the usage of prepositions increase.

Postpositional phrases are very marginal and there are only very few examples I could find in the Cosmas Corpus. The normal case is to have a prepositional phrase embedded into a NP. Some postpositions could not occur in such a recursive rule set: *Halber* and *zuwider* can only be used postpositionally and they cannot occur in a recursive rule set. Both adpositions are not very frequent and kind of unusual nowadays.

But still, even if postpositional phrases do occur in recursive rule sets, they are extremely rare. Why is this the case? We can imagine that these structures died out very early since they are less optimal. Let us assume that rule sets with postpositions developed out of verb particle fronting. When they are used in a recursive rule set, they turn out to be less optimal and prepositional usage might develop.

5.6. Early Immediate Constituents approach

In the following, we will compare Early Immediate Constituents in adpositional phrases, since distance relative to the head gives us insight into parsing difficulties of relevant structures.

Here, we look at the distance between the head of the embedded structure, which is an adpositional phrase and the head of the VP, which is the head-verb.

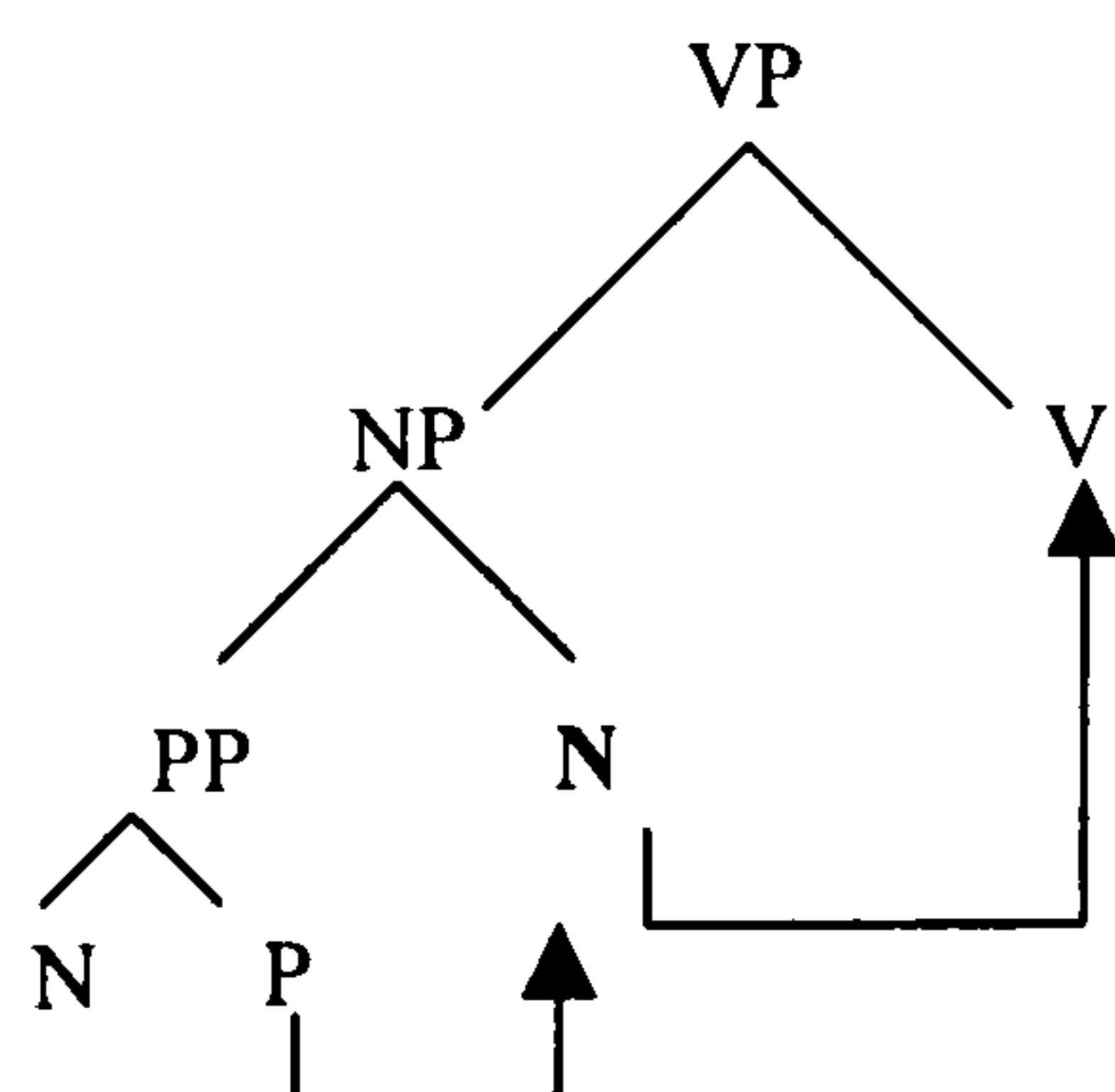
Consistent Recursive Rule set

First we consider adpositions occurring in a consistent recursive rule set, which is the usual type. We will also discuss the case of adpositions in an inconsistent recursive rule set.

Consistent Recursive Rule sets

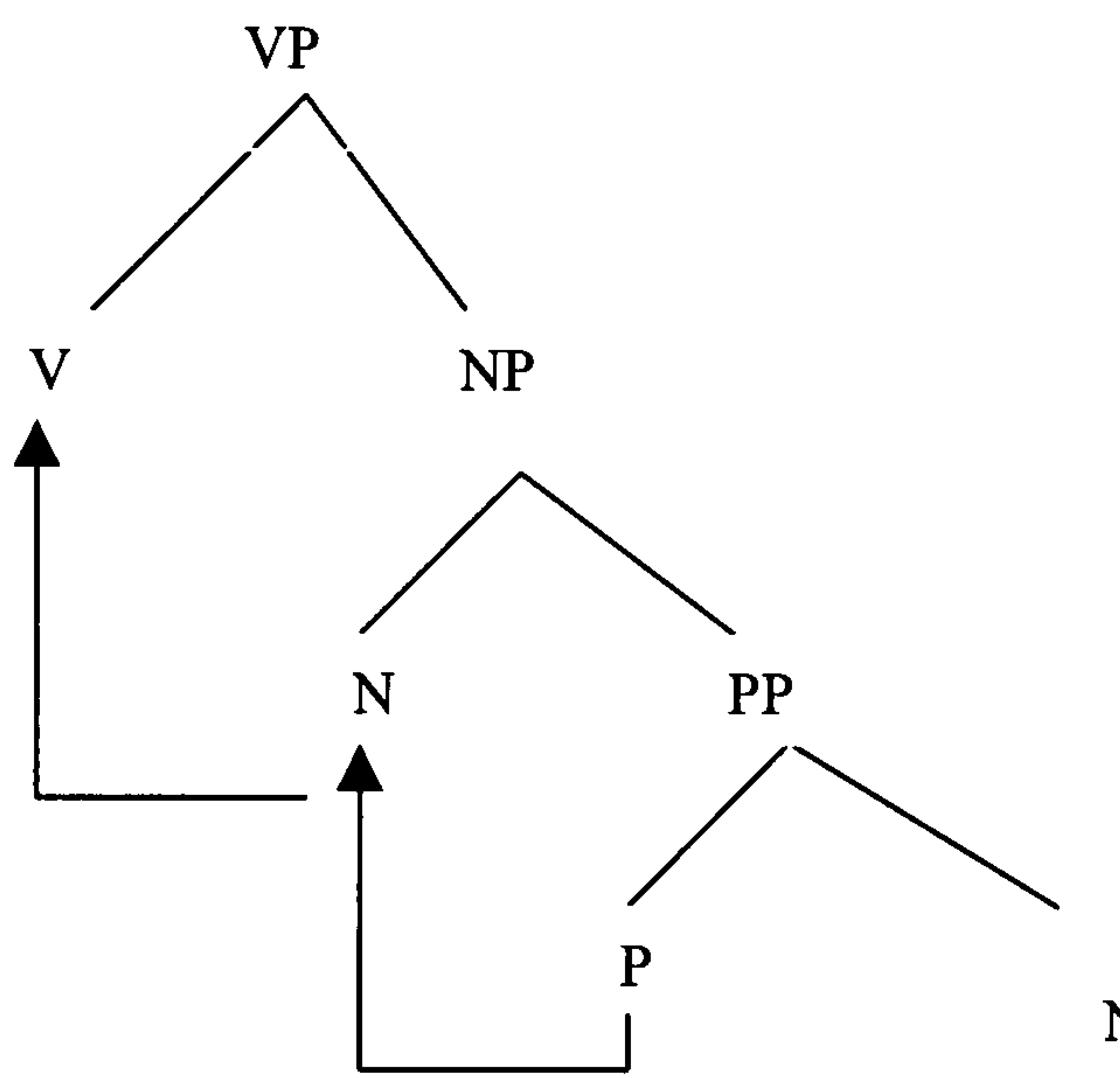
Here in 102a) we have a postpositional phrase embedded in a noun phrase with a verb-final structure. This structure is consistent since the NP is head-last as well as the PP and the VP. According to Hawkin's analysis, the distances between the heads are adjacent.

102a)



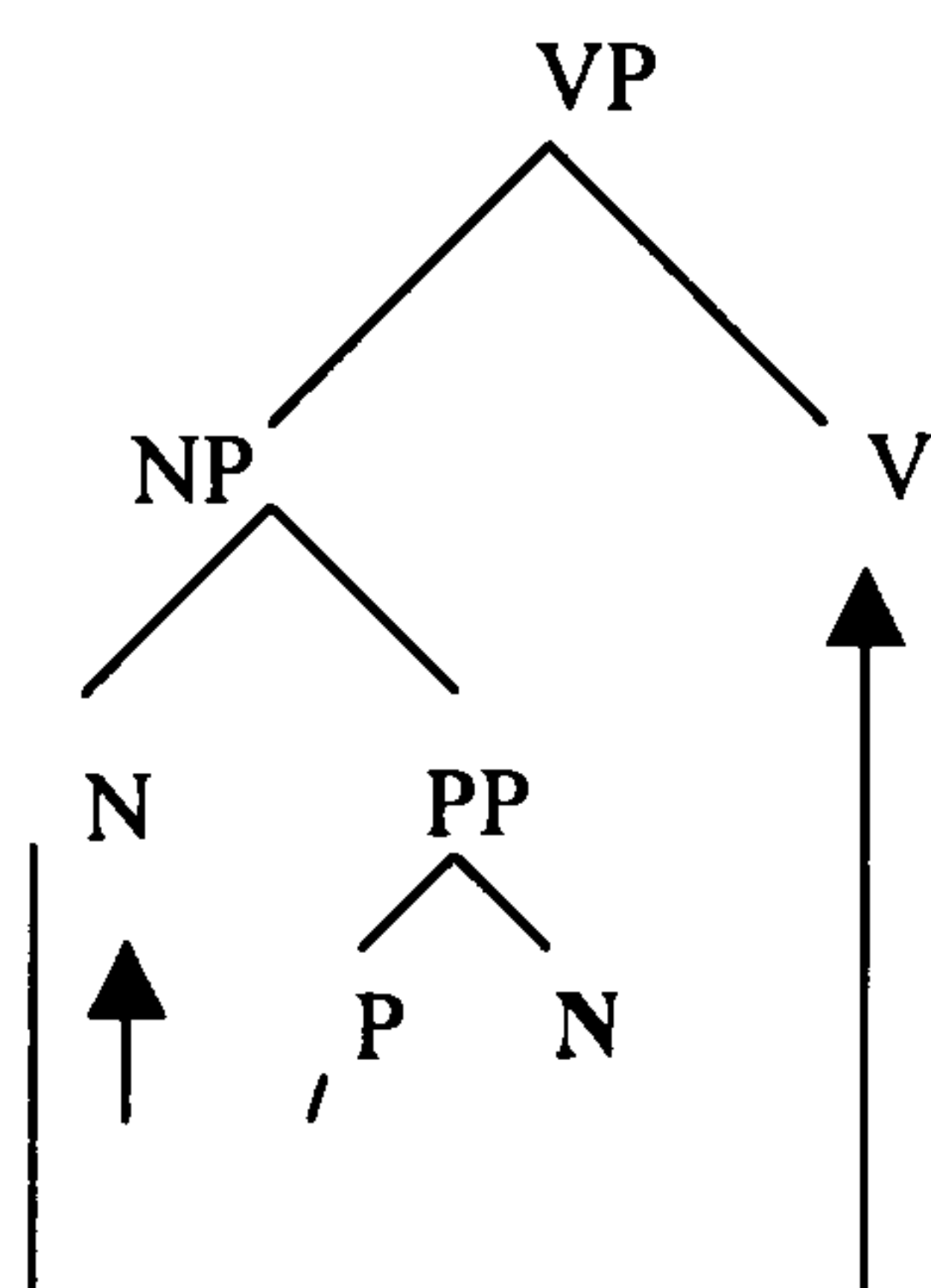
102b)

The recursive rule set is head-first and the VP is head-first.



As in structure 102a) the VP is head-last, the verb occurs in final position. But the NP and the PP are head-first. As we can see, the distance between the head noun and the head verb is not optimal.

102c)

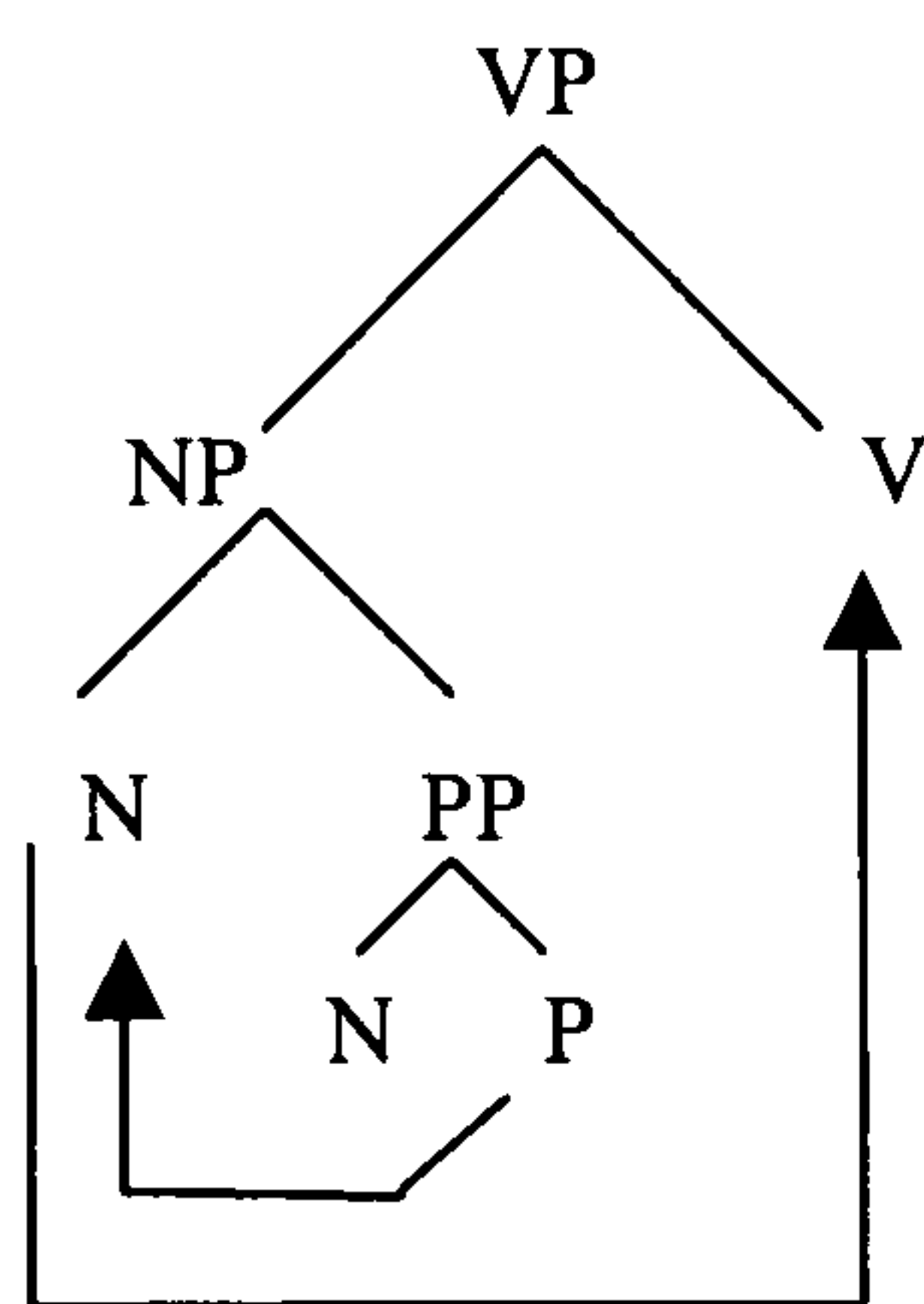




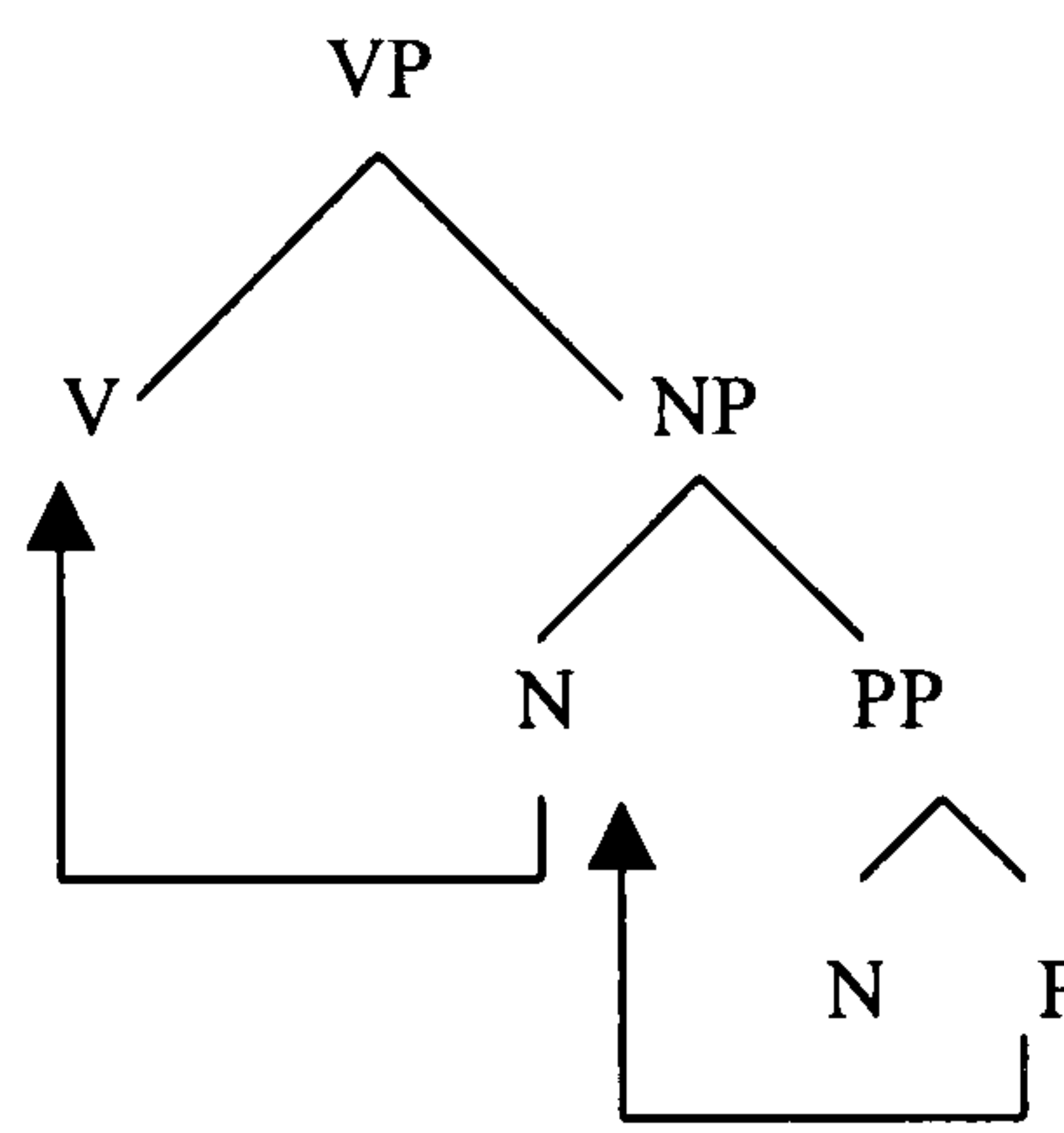
Inconsistent Recursive Rule Sets

Here, we will only consider the case of the inconsistent recursive rule set in which the head noun is first, since this is the case in German. But consider that the same applies to the head-last situation.

103b)



103c)



If we compare 103b) with 102b), we realise that this structure is less optimal in the sense that the distance between P and N is larger. The same applies for 103c).

Considering this we can imagine that the postposition gets under pressure, and by the following preposed for making the parsing more optimal.

Inconsistent Recursive Rule sets

If we consider possible inconsistent recursive rule sets, we get two possible structures:

First, we can have a postpositional phrase which is embedded in a head-first NP, thus we get the surface structure 'NNP'. This is the structure we mentioned for German. Then secondly, we can have a prepositional phrase which is embedded in a head-last NP, thus we get the surface structure 'PNN'.

We take verb-final and verb-medial positions and their respective distance into account. For the first inconsistent recursive rule set, we get then:

Verb-final	Verb-medial
a1) VP[NP[N PP[N P]]V]	opposed to a2) VP[V NP[N PP[NP P]]]
b1) VP[NP[PP[P N] N] V]	opposed to b2) VP[V[NP[PP[P N] N]]]

We are particularly interested in a) since we can find it in German. Structure a1) is inconsistent because the heads are not all adjacent. As we discussed we assumed that this structure was a transfer of a verb particle in a transparent construction. So, how is such a structure analysed:

First, we will assume that German is a verb-final language³², which is not an unusual view:

VP[NP NP P_v V]

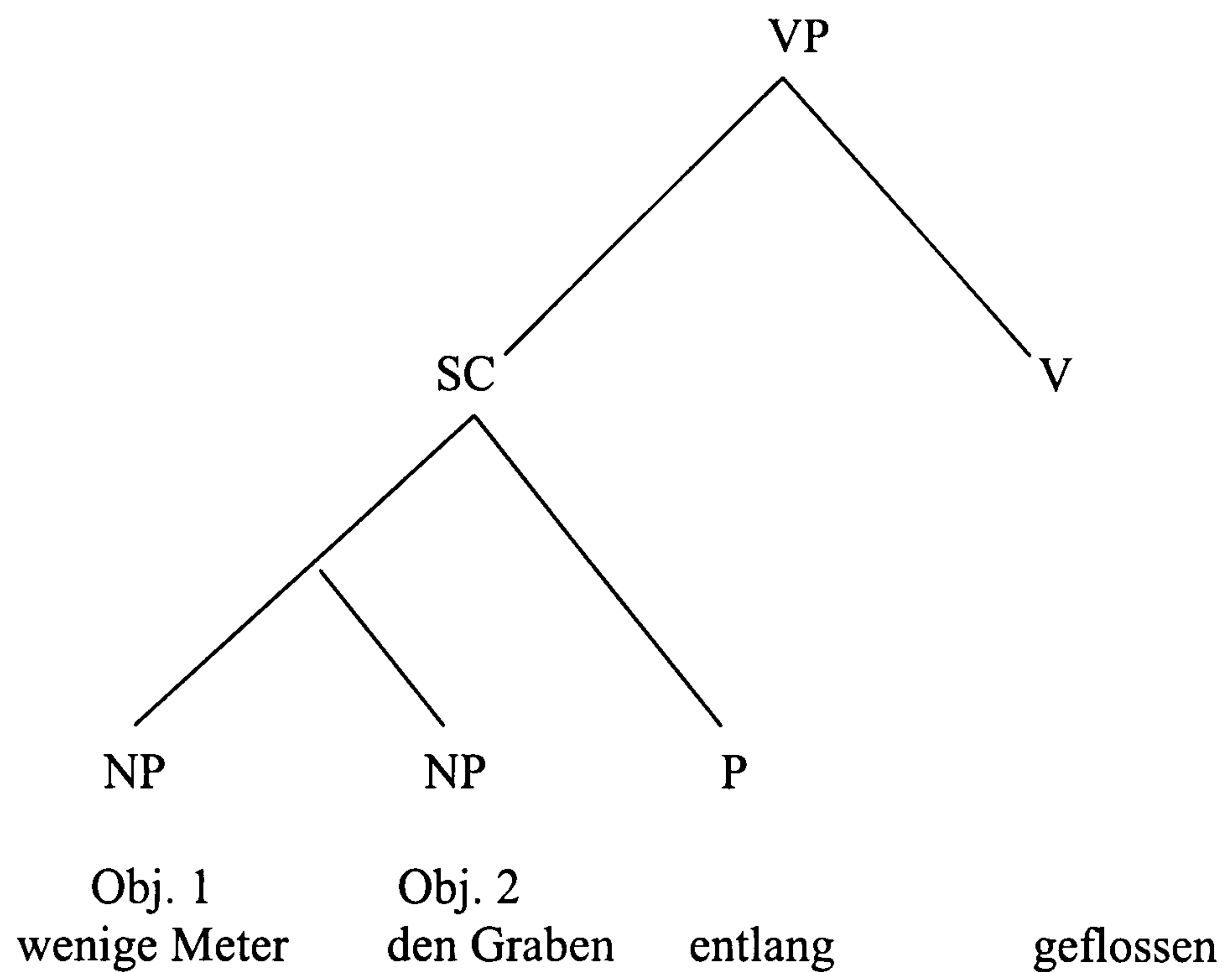
³² German is considered of being a verb final language. Consider these three examples:

- 1) Er ist den Fluss entlanggegangen
- 2) Er geht den Fluss entlang
- 3) Er sagt, dass er den Fluss entlanggegangen ist

We see that the particle, which is then governed by the verb appears adjacent to the verb. We do not have a recursive rule set as before, but two noun phrases, which are objects of the verb phrase.

If we represent in a graphic, it would look like this:

104)

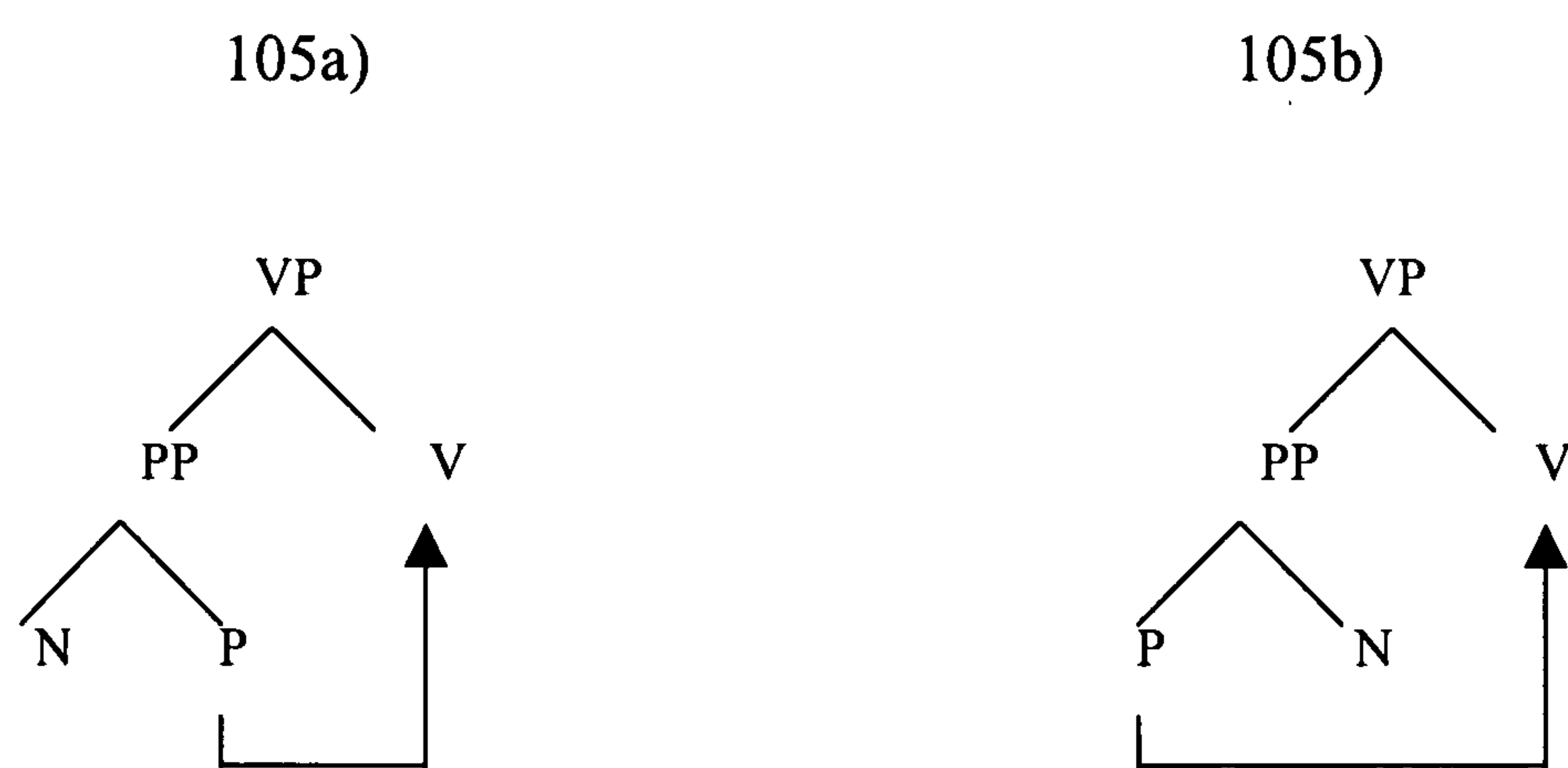


‘Das Wasser ist wenige Meter den Graben entlanggeflossen’.

To conclude, we can say that the German inconsistent recursive rule set discussed above is a transfer from a verb phrase structure, where the verb particle follows the respective nouns.

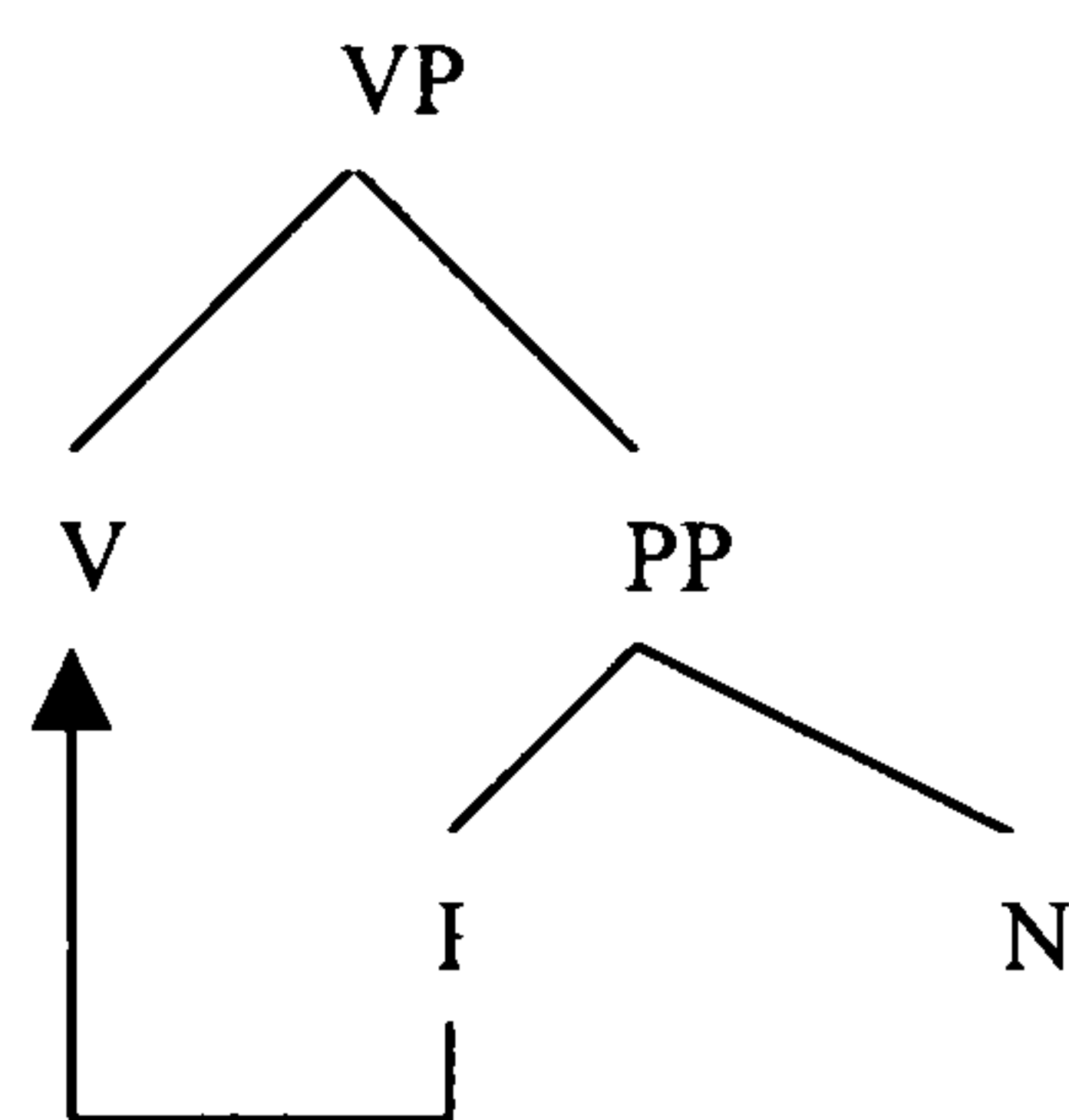
5.7 Distance between adpositional phrase and verb phrase

In the following, we will see that this distance between P and V changes if P is not embedded in a recursive rule set as assumed before. In 105a) the verb phrase is head last and the PP is head last, and no center-embedding occurs between the P and the V, while in 105b) the VP is head-last, but the PP is head-first, and center-embedding occurs between the P and the V.

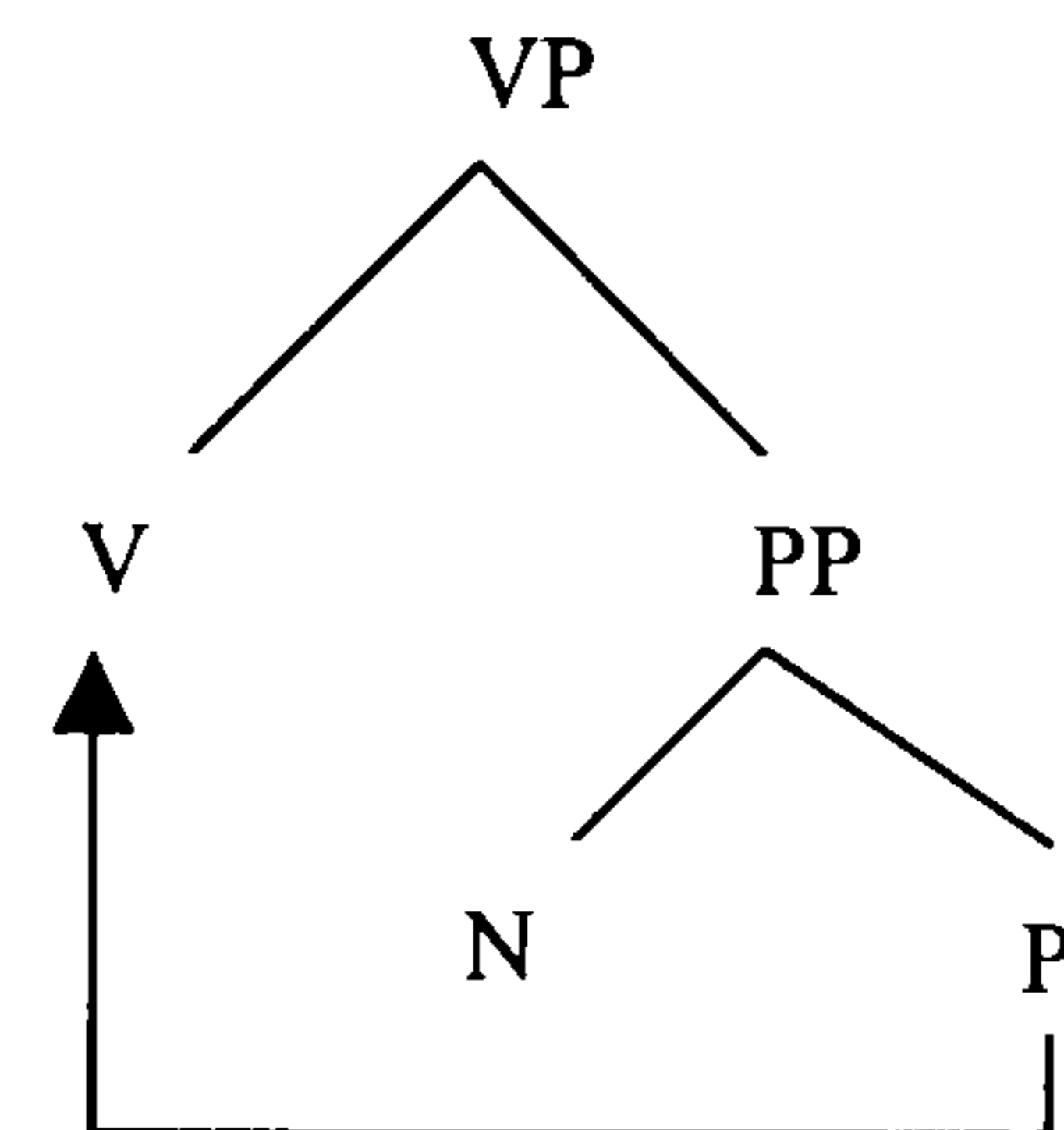


The same happens when the verb is head-first. In 106a) the verb phrase is head-first and the PP is head-first and no center-embedding occurs between P and V, while in 106b) the VP is head-first and the PP is head-last, and center-embedding occurs between P and V.

106a)



106b)



As long as adpositions occur in a recursive rule set, German has usually prepositions.

Overall, when the particle is verb-governed, it appears in a position following the noun, often adjacent to the verb. Adpositions can occur in both pre- and postpositions, but occur as prepositions in a recursive rule set apart from a few exceptions.

5.8. Statistics on the degree of grammaticalisation of German postpositions

According to what has been said so far, we should expect that postposition decreased and that prepositions got more frequent. This is indeed the case. For illustrating this, I present the table from Di Meola (2000). She used the corpus of Bertram et al. (1997), that comprises literary works of 58 authors from 1750-1920 compared with her own corpus for the modern German language (table 5.3).

Table 5.3: 'Postpositions develop into prepositions'

	Post Ancient	Pre Ancient	Total	% Pre Ancient	% Pre Modern Corpus
Betreffend	66	2	68	3%	26%
Entgegen	1383	55	1438	4%	45%
Gemäss	532	26	558	5%	97%
Näher	342	23	365	6%	3%
Bar	13	1	14	7%	88%
eingeschlossen	9	1	10	10%	16%
Gegenüber	1246	172	1418	12%	73%
Entlang	291	44	335	13%	68%
Ähnlich	429	75	504	15%	56%
Nahe	215	45	260	17%	79%
Nah	113	31	144	22%	75%
ausgenommen	276	94	370	25%	79%
zu Ehren	151	58	209	28%	83%
entsprechend	30	12	42	29%	75%
Eingedenk	35	36	71	51%	50%
Wegen	1166	1911	3077	62%	96%
Zum Nutzen	9	16	25	64%	71%
Gleich	729	1479	2208	67%	82%
Ungeachtet	108	234	342	68%	98%
Fern	77	190	267	71%	36%

Table 5.3 in: Di Meola (2000), p. 232, 233

Post-Postposition
 Pre-Preposition
 Ancient- Ancient corpus
 Modern corpus

As we can see, postpositions have the tendency to develop towards prepositions in the course of time when these words get more ‘grammaticalised’ as adposition. This is something we have shown above, when the word gets functional enough to occur in a recursive rule set.

Di Meola (2000) points out that minor grammaticalised postpositions are restricted to postpositions. This is also something we said before when we said that adpositions that develop from adverbs and verb particles first occur after the noun but then when it can occur in a recursive rule set, it develops towards a preposition.

These minor grammaticalised postpositions are following di Meola (2000):

Adverbs such as: *hinauf hinab abwärts aufwärts zunächst etc.*

Adjectives such as: *lang breit zuwider*

Participles such as: *folgend ausgeschlossen mitgerechnet inbegriffen inbegriffen*

Prepositional phrases such as: *zum Trotz, zuliebe, zufolge etc.*

All these postpositions cannot occur in a recursive rule set.

Postpositions of medial grade of grammaticalisation alternate between postpositions and prepositions and used to be only postpositional.

These postpositions are according to di Meola (2000): *entgegen entlang gegenüber betreffend entsprechend eingeschlossen ausgenommen ungeachtet nahe nah näher fern ähnlich gleich bar eingedenk gemäss, zum Nutzen zu Ehren wegen*

Some of the adpositions can occur in a recursive rule set. Others would be rather unusual such as *näher*. In the modern Corpus of di Meola (2000), only one instance of *näher* as a preposition was found out of 35 occurrences.

Further on, di Meola (2000) says that the higher the part of prepositions the stronger the grade of grammaticalisation. The postpositions with the strongest syntactic grade of grammaticalisation have developed thus to pure prepositions.

5.9. The transition from circumpositions to prepositions

Another kind of grammaticalisation we can find in structures called circumpositions, which also had an increase in prepositions:

Table 5.4: 'The decrease of 'circumpositions''

	Post Ancient	Pre Ancient	Total	%Pre Ancient	%Pre Modern Corpus
auf ... Vorschlag / auf Vorschlag	4	-	4	0%	83%
zu ... Zeiten / zu Zeiten	63	11	74	15%	66%
an ... Stelle / an Stelle, anstelle	53	26	79	33%	93%
in ... Anwesenheit / in Anwesenheit	2	1	3	33%	89%
Unter ... Führung / unter Führung	5	3	8	38%	96%
Von ... wegen / von wegen	150	104	254	41%	21%
an ... Rand / am Rand	52	37	89	42%	96%
in ... Rahmen / im Rahmen	1	2	3	67%	99%

an ... Statt / an statt	67	234	301	78%	56%
in ... Abwesenheit / in Abwesenheit	8	29	37	78%	80%
in ... Gegenwart / in Gegenwart	48	185	233	79%	80%
bei ... Anblick / beim Anblick	21	92	113	81%	88%
in ... Auftrag(e) / im Auftrag(e)	4	23	27	85%	93%
Nach ... Art / nach Art	23	131	154	85%	95%
mit ... Hilfe / mit Hilfe, mithilfe	19	113	132	86%	92%
in ... Bereich / im Bereich(e)	1	7	8	88%	98%
in ... Fall / im Fall(e)	6	46	52	88%	99%
auf ... Kosten / auf Kosten	16	133	149	89%	98%
zu ... Gunsten / zu Gunsten, zugunsten	11	96	107	90%	97%
zu ... Ehren / zu Ehren	5	58	63	92%	97%
zu ... Nachteil / zum Nachteil	2	23	25	92%	90%
zu ... Zweck / zum Zweck(e)	1	11	12	92%	97%
in ... Begleitung / in Begleitung	4	76	80	95%	92%
in ... Verlauf / im Verlauf	1	32	33	97%	87%
in ... Folge / in Folge, infolge	4	192	196	98%	97%

Table 5.4 in: Di Meola (2000), p. 233, p. 234

Post-Postposition
Pre-Preposition
Ancient- Ancient corpus
Modern corpus

As Di Meola (2000) points out most of the circumpositions decreased and prepositional usage increased instead. Striking exceptions are *von wegen* and *anstatt* for those

prepositional usage decreased. According to Di Meola (2000), one explanation could be the increase of the short forms of *wegen* for *von wegen* and of *statt* for *anstatt*, which competed with the full forms.

Nowadays, according to Di Meola (2000), only pronouns and proper names could occur in the circumposition, while in earlier language stages any NPs with determiners and attributes could do so. Let us consider the following examples (Di Meola (2000)). Example (42) dates from 1816, example (43) from 1810, example (44) from 1813, example (45) from 1886, example (46) from 1776, and example (47) dates from 1841.

107) Camillo, nach ruhmvollen Taten dürstend, schrieb sofort an seinen ältesten Sohn Francesko, dass er kommen mage, **in des Vaters Abwesenheit** das Land zu regieren.

(E.T.A. Hoffmann, *Die Elixiere des Teufels*. In : E.T.A. Hoffmann : *Poetische Werke in sechs Bänden*. Berlin: Aufbau, 1963, Bd. 2, p. 287)

108) So verfestigte er, mit Hülfe eines Notars, **zu seiner Kinder Gunsten** ein Testament, und setzte den Amtmann zu Kohlhaasenbrück, seinen wackren Freund, zum Vormund derselben ein.

(H. von Kleist, *Michael Kohlhaas*. In: S. Streller et al. (eds.), 1978. *Heinrich von Kleist : Werke und Briefe in vier Bänden*. Berlin/Weimar: Aufbau, Bd. 3, p.107)

109) Hier tritt Ahasverus hervor, **nach hartverständiger Menschen Art**, die, wenn sie jemand durch eigene Schuld unglücklich sehen [...], das Übel durch Vorwürfe vermehren;

(J.W. Goethe, *Aus meinem Leben. Dichtung und Wahrheit*. In: E. Trunz (ed.), 1959-60. *Goethes Werke: Hamburger Ausgabe in 14 Bänden*. Hamburg: Wegener, Bd. 10, p. 46)

110) So scherzte man einfach weiter, bis man schliesslich, **auf des Präzeptors Vorschlag**, sich für ein einfaches Blankenburger Bier entschied [...].

(Th. Fontane, *Cécile*. In: P. Goldhammer et al. (eds.), 1973. *Theodor Fontane: Romane und Erzählungen in acht Bänden*. Berlin/Weimar: Aufbau, Bd. 4, p. 407)

111) Man füge endlich noch hinzu, dass die Fräulein wenigstens **in ihrer Mutter Gegenwart** beständig französisch redeten und in ihrer Fertigkeit in dieser Sprache sichtlich zunahmen;

(Friedrich Nicolai, *Leben und Meinungen des Herrn Sebalduß Nothanker*. Berlin: Rütten & Loening, 1960, p. 149).

112) Er hatte im Stillen gehofft, einmal wieder recht trinken zu können **auf anderer Leute Kosten**, nun ging es ihm umgekehrt.

(J. Gotthelf, *Wie Uli der Knecht glücklich wird*. In: W. Muschg (ed.), 1978. *Jeremias Gotthelf: Ausgewählte Werke in zwölf Bänden*. Zürich: Diogenes, Bd. 1, p. 60).

The circumpositions of the preceding sentences would be translated in the following way:

113) **in des Vaters Abwesenheit**

in the father [Gen.] **absence**

‘in the absence of the father’

114) **zu seiner Kinder Gunsten**

to his children [Gen.] **favour**

‘to the favour of his children’

115) **nach hartverständiger Menschen Art**

to hard-understanding human [Gen.] **manner**

‘according to hard-understanding human manner’

116) **auf des Präzeptors Vorschlag**

on the teacher (educator) [Gen.] **proposal’**

‘on the teacher’s proposal’

117) **in ihrer Mutter Gegenwart**

in her mother [Gen.] **presence**

‘in the presence of her mother’

118) **auf anderer Leute Kosten**

at other people [Gen.] **expense**

‘at the expense of other people’

As we can see, the circumposition consists of a preposition and a noun (in bold). The noun in between this circumposition used to be nouns in the genitive case. So, basically we have here a genitive phrase ‘Gen N’ preceded by a preposition. It is a head-last structure, since the head of the phrase, the noun, follows Gen. This structure as we have seen is quite common in the 18th and 19th century. The noun then occurring after the genitive was grammaticalized as a postposition. But as mentioned before, nowadays only pronouns and proper names can occur in the circumposition. The genitive phrase that was preceded by a preposition was a left-branching genitive phrase which is rarer nowadays and the right-branching genitive is more usual nowadays. So to retake the examples in a small table, the genitive would follow the noun in the modern language (genitive is in bold characters):

Table: Position of Genitive

Ancient	Modern
In des Vaters Abwesenheit	in Abwesenheit des Vaters
Zu seiner Kinder Gunsten	zu Gunsten seiner Kinder
Nach hartverständiger Menschen Art	nach Art hartverständiger Menschen
Auf des Präzeptors Vorschlag	auf Vorschlag des Präzeptors
In ihrer Mutter Gegenwart	in Gegenwart ihrer Mutter
Auf anderer Leute Kosten	auf Kosten anderer Leute

Table 5.5

So, we can see here that the noun is then fronted and if grammaticalised as an adposition, it would be a preposition.

5.10. Degree of Grammaticalisation of adpositions

The question is of course to which degree these nouns are grammaticalised. According to Di Meola (2000), there is a continuum of grammaticalisation that goes from postpositions, which are the least grammaticalised elements to pure prepositions, which are the most grammaticalised elements. Let us take a look back in diachrony. As we have seen adpositions like ‘*von ... wegen*’ developed this way. *Wegen* lost its semantic meaning of ‘side’ or ‘way’ totally and cannot be recognised as a noun anymore. In table (4), all nouns in the circumpositions are still autonomous nouns and can thus be used in contexts outside this circumposition. So the full meaning is still there, and it is difficult to argue for bleaching of meaning, which is a prerequisite for grammaticalisation (Haspelmath, 1994). In some cases, there seems to be a cue for such a bleaching, especially there where orthography changed. So, *an Stelle* is replaced by *anstelle*, *an Statt* is replaced by *an statt*, *mit Hilfe* became *mithilfe*, *zu Gunsten* became *zugunsten*, and *in Folge* became *infolge*.

If we come to adverbials and verb particles that got into adpositional usage and then changed from postpositions into prepositions, it is not clear if the passage from postpositions towards prepositions involved some semantic bleaching. For example *entlang* (along) is still understood as a particle that expresses a kind of geographical continuum, and this does not change if it is used as a postposition, as a preposition or as a preposition in a recursive rule set.

We can surely speak in all these cases of reanalysis, but grammaticalisation prerequisites semantic bleaching, which is often not observable.

5.11. Did postpositions arise because of a left branching tendency?

According to Lehmann (1971), German developed SOV-characteristics. According to him, German used to be “more consistently SVO in the medieval period than it is at present”. This would make German special in the sense that usually changes from SOV towards SVO-characteristics have been observed but not the inverse without the influence of language contact. But, as we have seen before, Old High German was basically verb final (Pittner (1995)). Lenerz (1985) pointed out that the finite verb was restricted to appear in subordinate clauses in verb final position, whilst before it also could occur in main clauses. So, what happened is that the word order of German got fixed in the sense that infinite verb elements had to appear in final position in main clauses while the finite verb had to be final in subordinate clauses.

Referring to Lehmann (1971), Bauer (1995b) argues that usually languages (especially observed in Indo-European languages) have a unidirectional, irreversible shift from left-branching towards right-branching. Bauer (1995b) argues that German developed already an SVO-typology in medial times and that then German underwent a retrograde shift towards OV. As we have seen before, German used always to be basically SOV, but in New High German it got fixed to clause structures. It is not the case that German acquired SOV in subordinate clauses, but that from then on verb medial structures were impossible in German subordinate clauses because of the introduction of the complementizer. The introduction of the complementiser is part of the process towards right-branching (see Antinucci (1979), Bauer (1995a) etc.) and so we cannot speak of retrograde change. Already before SOV was more frequent in subordinate clauses, and we know that this is a cross-linguistic phenomenon. Second, Lehmann (1971) and Bauer (1995b), who is referring then to Lehmann, claim that postpositions entered the

language because SOV was established in subordinate clauses. SOV was not rare in Middle High German in subordinate clauses and more importantly, it is known in language acquisition that children learn syntactic cues from un-embedded domains (see Lightfoot). At this time, when this fixing of German word order took place, verb separation or '*Distanzstellung*' became more frequent. Verb particles appeared then frequently after the noun in embedded and unembedded structures. So, I suggest that some postpositions derived from verb-particles as discussed above. Postpositions were not really a further left-branching structure since it cannot occur in a recursive rule set and once adpositional postpositions occurred, prepositions developed that can be used in a recursive rule set and the usage of prepositions increased. These adpositions were only 'born' from elements that stood in a position after the noun. Bauer (1995b) also points out that prepositions got more frequent in German:

And if indeed some postpositions were created which form part of a left-branching language structure, their number was limited and decreased in the course of time: most of them are either plain prepositions or can occur in both positions (...) Consequently these adpositions do not contradict the general tendency toward anteposition.

According to Hawkins (1979), postpositions occurred in Early New High German because of the increase in frequency of SOV-structures. Hawkins states that German acquired a non-basic prenominal relative clause with the structure 'Rel N'. It is non-basic because the basic German relative clause is right-branching and takes a relative pronoun and has the structure 'N Rel' such as in:

119) *Den Mann, den ich sehe, ist gross.*

N **Rel**

‘The man who I see is big’.

So, the non-basic prenominal relative clause is a participial structure (see also Bauer (1995b) such as in:

120) *die vor kurzem noch blühenden Blumen* (Bauer (1995b)).

the (det.) recently still blooming (part.) flowers (noun).

‘the flowers that were blooming recently’

It can also be expressed by ‘N Rel’-structure:

121) *Die Blumen, welche vor kurzem blühten.*

N **Rel**

‘the flowers that were blooming recently’.

According to Hawkins (1979), postpositions had to develop because of the following constraints. Universal VI of Hawkins says that a language, which has prepositions and SVO or VSO, cannot have Rel N. Since German has Rel N, so Hawkins (1979):

“it may have either POST with VSO or SVO, or Prep with SOV (i.e. neither VSO nor SVO), or else POST with SOV. Early New High German develops minority rel+n structures. According to the FIH³³, therefore, the acquisition of rel+n must be accompanied by frequency increases in either postpositions or SOV, or in both. In

³³ The Frequency Increase Hypothesis (FIH)

fact, both SOV and postpositions increase simultaneously with pronominal relatives. By the DAH³⁴, the new minority, rel+n, must be accompanied or preceded by the acquisition of either POST or SOV, or both; and this is fulfilled. ”

So, Hawkins (1979) says that the occurrence of verb-final structures (SOV) and Rel. + N-structures subsequently triggered the emergence of postpositions. But, as discussed above, verb final structures did not really increase and postpositions cannot occur in a recursive rule set and postpositions decreased right after their occurrence. Bauer (1995b) points out that the Rel N-structure is rather a construction of grammarians of the sixteenth-century:

The use of the participle, which is often the equivalent of a subordinate clause, is commonly attributed to the sixteenth century Latin translations and to the grammarian's prescriptions afterwards. Consequently, its occurrence was not the result of the natural development of language, but of external, scholarly influence.

So, this structure is quite unnatural and belongs rather to an elevated written language than to the more natural spoken one.

5.12. Conclusion of diachronic development of German adpositions

We have seen that with the fixing of German word order, which did not consist of an increase in verb-final structures, the Distanzstellung was obligatory in German, which means that in main clauses the verb particle had to appear in sentence-final position, while the verb, which governs the particle, moved to Comp. The introduction of a complementiser is considered of being part of the right-branching process. In such a

³⁴ The Doubling Acquisition Hypothesis (DAH)

position the verb-particle often appears just after the noun. Learners use unembedded contexts for learning parameters of their language and thus they might analyse it as postpositions, so particles that govern nouns.

Postpositions deriving from adverbs or verb particles have to be considered as an adposition that is still similar to an adverb or verb particle, and which for this reason can still occur postpositionally. First as we have seen the postposition will be governed by a noun and not by a verb anymore. This can easily happen since the N is adjacent. Once the adposition is used in a recursive rule set such as 'N P N', it will develop towards a preposition. Once an adposition could be used in such a recursive set, its postpositional use decreased also in structures where PPs are not embedded in an NP.

Other postpositions emerged from nouns in circumpositions. We have seen that the genitive phrase, which preceded the noun still in the 19th century, was postposed later on, which is a right-branching tendency, and that postpositions that emerged from this former construction were preposed as well.

These explanations do not have to take into account any retrograde changes, which would violate the general observed development in Indo-European languages towards right-branching structures. As we have seen, German did not really increase its verb-final structures and also other structures, which would be a hint for left-branching, seem to be constructions of grammarians.

5.13 Experimental Approach of the Emergence of some postpositions

5.13.1. Introduction

As we mentioned before in the theoretical part of this chapter, languages seem to have a unidirectional tendency to develop from left towards right-branching structure. According to this view, the introduction of postpositions in German was seen as an exception to this trend. We argue that processes involved in grammaticalisation independent of a retrograde shift towards left-branching were responsible for the emergence of postpositions in the 17th century. The reported particles that had a development towards postpositions derived generally from adverbs, especially verb particles. We saw that the particles that developed into postpositions had the property to be able to undergo fronting, while particles that could not be fronted did not undergo such development. Frontable particles can be contrasted in constructions where they occur. So ‘along’ can be contrasted with ‘down’, ‘up’ etc in a construction such as ‘to go along’. Unfrontable particles occur in more idiomatic constructions, so in ‘to eat up (aufessen)’, ‘up’ cannot be contrasted with another particle. Particles that could be fronted gave way to the development of postpositions (for properties of frontability of verb particles, see (Wurmbrand (2000), Zeller (2003))).

.So, if we have an unmarked sentence such as: ‘I go the way along’. The particle ‘along’ can be fronted such as in ‘Along go I the way’. When postpositions arised, not only the particle could be fronted but as well the preceding noun. So we could get ‘The way along go I’. The object noun and the particle are adjacent and it is known in

grammaticalisation that this favours grammaticalisation. In experimental work, we will show that this path of grammaticalisation is quite productive. We will show that particles that are judged to be more likely to be fronted, are also more likely to be used as postpositional adpositions.

In this experiment, we have two major kinds of verb particles. Particles that occur in idiomatic constructions and are not subject to reanalysis and verb particles that occur in transparent constructions and can then be reanalysed. We took frontable verb-particles that did not undergo the development towards postpositions. So, in ‘I send **the letter back**’, the particle can be fronted such as in: **Back** send I the letter. But the preceding noun cannot be fronted together with the particle as in: ***The letter back** send I. We will show that in such constructions where the particle can be fronted reanalysis can occur. Verb particles that occur in idiomatic constructions and thus cannot be fronted and they will be less likely to develop into postpositions.

We now test in an experiment this explanation with German native speakers. In this experiment, participants had to judge sets of sentences according to their degree of acceptance (Bard et al, 1996). In this experiment, we will see that semantic and syntactic properties of a class of words can show us which linguistic changes are more likely to occur. Here, we will see that the frontability of particles is the best predictor of which of those particles will develop into postpositions.

5.13.2 Stimuli

According to the earlier discussion, the sentences to be judged can be divided into two major groups: There are particles that occur in constructions with transparent constructions and particles that occur in idiomatic constructions.

1. Particles in idiomatic constructions cannot be fronted and are thus not subject to grammaticalisation.

We used the following idiomatic constructions (particle + verb) in this experiment:

auf-führen, vor-schlagen, an-sehen, zu-hören, ab-sagen, mit-nehmen, ein-nehmen
 ‘to perform’ ‘to suggest’ to look at’ ‘to listen to’ ‘to cancel’ ‘to take with’ ‘to gain’

Table 5.6: Predictions of acceptability of particle positions in idiomatic constructions

Basic Sentence	Particle Fronting	Postpositional Fronting
!! Er führt das Stück auf	*Auf führt er das Stück	*Das Stück auf führt er

!! – very acceptable !-acceptable ?! less acceptable *unacceptable

2. On the other hand, particles in transparent constructions can be grammaticalised and we find different degrees of grammaticalisation. Remember that grammaticalisation refers according to Lehmann (1995) to a development where a lexical or grammatical item acquires a more grammatical status. Because of the larger variety for particles in transparent constructions, we divided them according to their degree of grammaticalisation in three subgroups (from the most grammaticalised to the least):

1. Verb particles that occur both as postpositions and prepositions. The prepositional phrase, of which the preposition is the head, can be embedded into a Noun phrase, thus $N \rightarrow NP (P N)$. Here, the preposition is the most grammaticalised particle, because the German prototype is a preposition and thus it can be embedded into a NP ('recursive rule set'). Here, we used the following particles:

entlang, gegenüber and entgegen

2. Verb particles that can also occur as postpositions. The particle as the head of a postpositional phrase cannot be embedded in a NP. For the experiment, we used here the following particles:

hinauf and hinunter

3. Verb particles that can be fronted, but that did not undergo the development towards postpositions. Here we used the following particles:

zurück and weg

Table 5.7: Predictions of acceptability of particles in transparent constructions

	Basic Sentence	Particle Fronting	Postpositional fronting
1) Verb-particles + Pre + Postpositions	!! Ich gehe den Weg entlang	! Entlang gehe ich den Weg	! Den Weg entlang gehe ich
2) Verb-particles + Postpositions	!! Ich gehe den Weg hinunter	! Hinunter gehe ich den Weg	!? Den Weg hinunter gehe ich
3) Verb-particles + fronting (no postpositions)	!! Ich gehe den Weg zurück	! Zurück gehe ich den Weg	*Den Weg zurück gehe ich

!! –very acceptable ! – acceptable !? –less acceptable *-unacceptable

5.13.3. Method

30 German native speakers (undergraduate students from the University of the Saarland in Germany) judged sentences according to a scale from 1 – the least acceptable to 5 – the most acceptable. The sentences were presented on a computer screen and the order of the sentences was randomised. The participants were asked to judge sentences according to what they feel to be acceptable in their native language. All participants were native speakers and undergraduate (1st and 2nd years) of the University of the Saarland. It was explicitly explained that the rates of judgments go from 1 to 5:

1- unacceptable

2- mainly unacceptable

3- could be unacceptable or acceptable

4 – rather acceptable

5- acceptable

A major part of the students had some linguistic training in their first or second year.

5.13.4. Results

In the following, we refer in the graphics to: 1-verb particles in idiomatic constructions; 2- particles in transparent constructions, that can also be used as postpositions as well as prepositions; 3-verb particles that can occur as well as postpositions, but the postpositional phrase cannot be embedded; 4-verb particles in transparent constructions that can be fronted, but did not undergo the development towards postpositions.

Verb particle in final position

In figure 1, we can see that all unmarked sentences reach an average of ‘5’, thus are judged as totally correct. The basic structure here is ‘SVfOP’. Just for those verb particles that can occur as well as prepositions and postpositions, this score is a bit lower with 4.7.

Figure 5.1 – Verb particle in final position

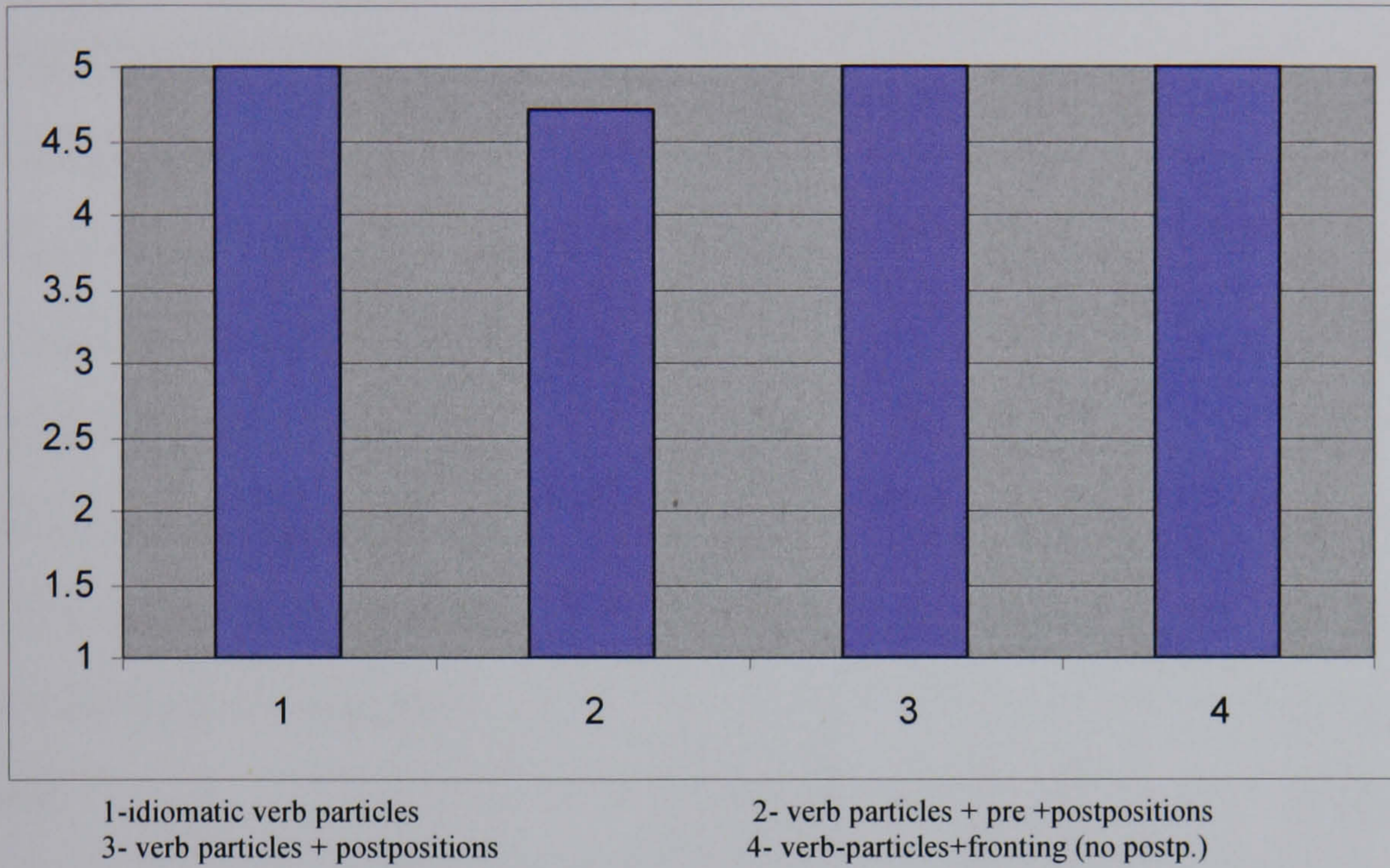


Table 5.8: Idiomatic verb particles in final position

Sentence	1	2	3	4	5	Mean
Er führt das Stück auf	0	0	0	0	27	5
Er schlägt den Minister vor	0	0	0	1	26	5
Er sieht sich das Bild an	0	0	0	0	27	5
Er hört dem Mann zu	0	0	0	0	27	5
Er sagt die Verabredung ab	0	0	0	0	27	5
Er nimmt den Jungen mit	0	0	0	1	26	5
Sie nehmen viel Geld ein	0	0	0	0	27	5
Total	0	0	0	2	187	5

Table 5.9: Particles (Pre-, Postpositions, verb particles) in final positions

Sentence	1	2	3	4	5	Mean
Ich gehe den Weg entlang	0	0	0	0	27	5
Er fährt die Strasse entlang	0	0	1	0	26	4.9
Sie radelt den Bach entlang	0	1	0	0	26	4.9
Ich gehe der Frau entgegen	0	0	0	0	27	5
Er handelt deinen Anweisungen entgegen	3	1	4	4	15	3.8
Er läuft seiner Freundin entgegen	0	0	0	0	27	5
Ich sitze dem Mann gegenüber	0	0	0	0	27	5
Er steht dem Bahnhof gegenüber	0	2	0	2	23	4.7
Sie wartet der Kirche gegenüber	3	5	3	1	15	3.7
Total	6	9	8	7	213	4.7

Table 5.10: Particles (Postpositions, verb particles) in final positions

Sentence	1	2	3	4	5	Mean
Er geht den Weg hinauf	0	0	0	0	27	5
Er fährt die Strasse hinauf	0	0	0	0	27	5
Er rennt die Treppe hinauf	0	0	0	0	27	5
Die Katze kletterte den Baum hinauf	0	0	0	0	27	5
Er läuft den Pfad hinunter	0	0	0	0	27	5
Er klettert die Leiter hinunter	0	0	0	0	27	5
Er schickt den Dienstboten hinunter	0	0	0	0	27	5
Er ruderte den Fluss hinunter	0	0	0	0	27	5
Total	0	0	0	0	189	5

Table 5.11: Verb Particles (no postpositions) in final position

Sentence	1	2	3	4	5	Mean
Er schickt den Brief zurück	0	0	0	0	27	5
Er läuft den Weg zurück	0	0	0	0	27	5
Er gab die Platten zurück	0	0	0	0	27	5
Er warf den Ball zurück	0	0	0	0	27	5
Das Hochwasser riss die Brücke weg	0	0	0	0	27	5
Die Männer räumten die Hindernisse weg	0	0	0	0	27	5
Er warf den Stummel weg	0	0	0	0	27	5
Sie wischte die Milch weg	0	0	0	0	27	5
Total	0	0	0	0	189	5

Particle fronting

Then, we looked at the acceptability of particle fronting (see figure 2). As we can see, it is less acceptable for particles in idiomatic constructions (1) to be fronted than for the particles occurring in transparent constructions (2,3,4). This difference is significant according to the Wilcoxon-test for items 1 compared to 2 with $p < .00$ ($Z = -7.276$) and 1 compared to 3 with $p < .00$ ($Z = -10.190$) and significant for 1 compared to 4 with $p < .00$ ($Z = -9.596$). If we look at the particles occurring in transparent constructions, we find no significant difference between 3 and 4, but we find a significant difference with 3 and 2 with $p < .00$ ($Z = -8.628$). One-way-Anova is also significant for the group 1-2 with $p < .00$ ($F = 20.933$), for the group 1-3 with $p < .00$, $F(233.203)$, for the group 1-4 with $p < .00$ ($F = 183.247$), for the group 2-3 with $p < .00$, $F(120.998)$, for the group 2-4 with $p < .00$, $F(43.417)$ and as for the Wilcoxon-test Anova is not significant for the group 2-3.

Figure 5.2 – Particle Fronting

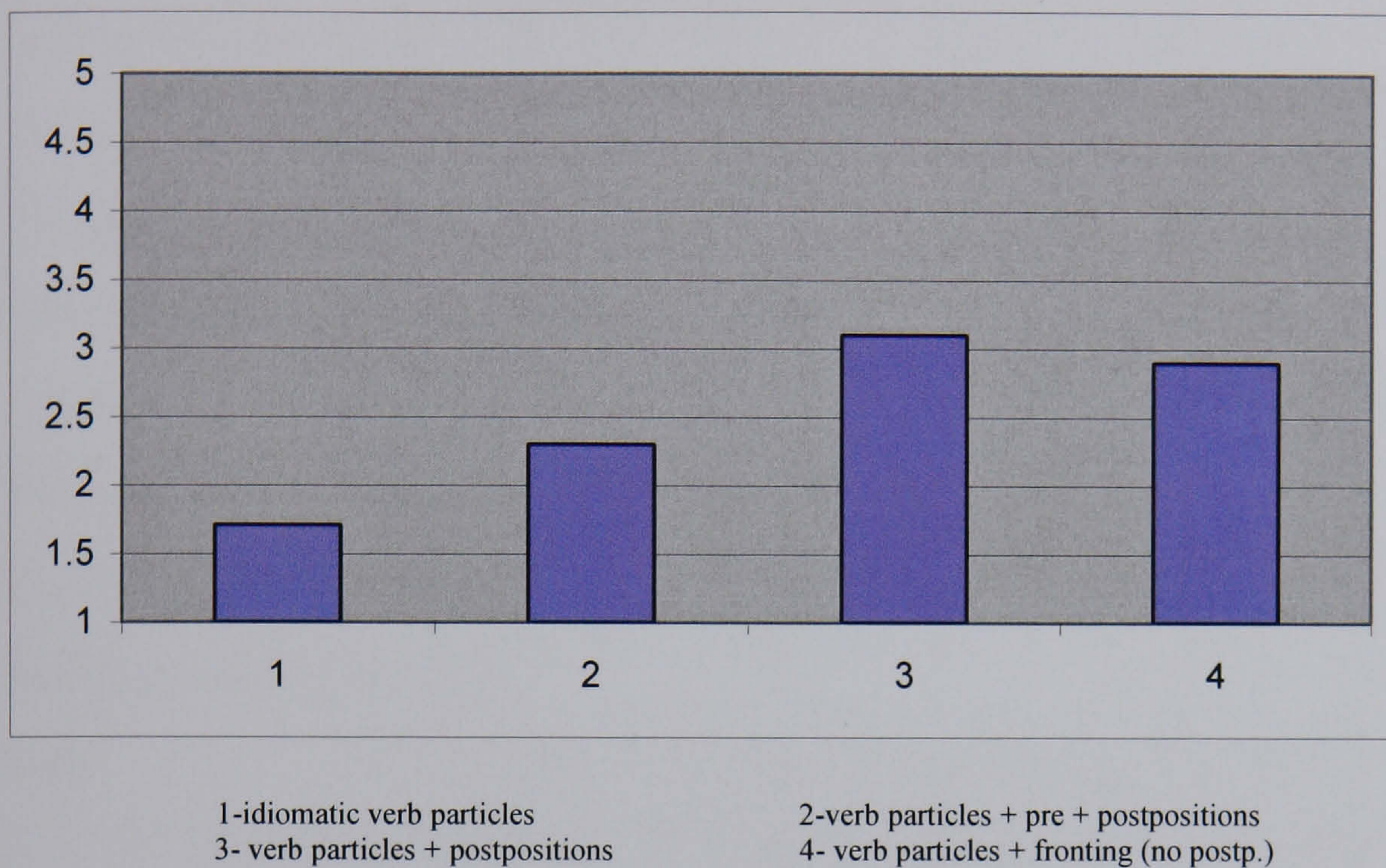


Table 5.12 : Idiomatic fronted verb particles

Sentence	1	2	3	4	5	Mean
Auf führt er das Stück	15	10	2	0	0	1.5
Vor schlägt er den Minister	16	7	2	2	0	1.6
An sieht er sich das Bild	12	11	3	0	1	1.8
Zu hört er dem Mann	14	9	2	2	0	1.7
Ab sagt er die Verabredung	14	9	2	2	0	1.7
Mit nimmt er den Jungen	11	8	5	3	0	2
Ein nehmen Sie viel Geld	15	7	4	1	0	1.7
Total	97	61	20	10	1	1.71

Table 5.13 : Fronted particles (Pre-, Postpositions, verb particles)

Sentence	1	2	3	4	5	Mean
Entlang gehe ich den Weg	2	8	10	5	1	2.9
Entlang fährt er die Strasse	4	4	9	8	2	3
Entlang radelt sie den Bach	8	8	8	2	1	2.3
Entgegen gehe ich der Frau	3	13	5	5	1	2.5
Entgegen handelt er deinen Anweisungen	15	8	3	1	0	1.7
Entgegen läuft er seiner Freundin	9	5	8	4	1	2.3
Gegenüber sitze ich dem Mann	4	6	10	6	1	2.8
Gegenüber steht er dem Bahnhof	10	9	5	3	0	2.1
Gegenüber wartet sie der Kirche	22	3	1	0	1	1.4
Total	77	64	59	34	8	2.3

Table 5.14: Fronted particles (Postpositions, verb particles)

Sentence	1	2	3	4	5	Mean
Hinauf geht er den Weg	1	4	7	13	2	3.4
Hinauf fährt er die Strasse	1	9	7	5	5	3.2
Hinauf rennt er die Treppe	2	6	7	9	3	2.8
Hinauf kletterte die Katze den Baum	2	12	7	4	2	2.7
Hinunter läuft er den Pfad	2	6	10	5	4	3.1
Hinunter klettert er die Leiter	0	6	8	7	6	3.4
Hinunter schickt er den Dienstboten	2	5	8	6	6	3.3
Hinunter ruderte er den Fluss	0	6	11	8	2	3.2
Total	10	54	65	57	30	3.1

Table 5.15: Fronted Particles (no postpositions)

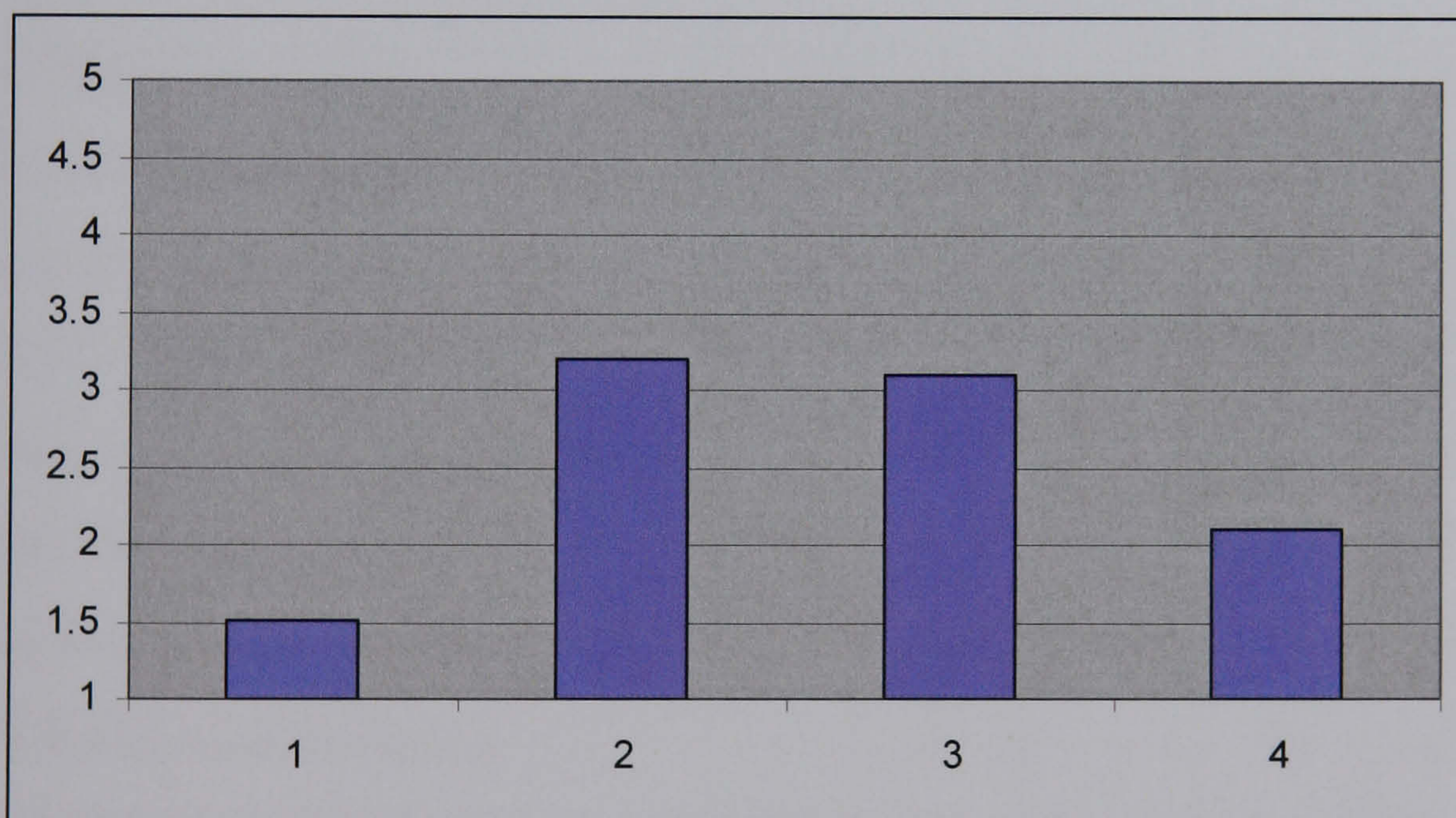
Sentence	1	2	3	4	5	Mean
Zurück schickt er den Brief	2	8	10	6	1	2.9
Zurück läuft er den Weg	4	6	8	8	1	3
Zurück gab er die Platten	2	10	6	6	3	2.8
Zurück warf er den Ball	0	6	7	11	3	3.4
Weg riss das Hochwasser die Brücke	2	9	3	12	1	3
Weg räumten die Männer die Hindernisse	5	12	6	4	0	2.3
Weg warf er den Stummel	1	9	6	8	3	2.7
Weg wischte sie die Milch	1	9	8	6	3	3
Total	17	69	54	61	15	2.9

Postpositional fronting

If we look at the acceptability of postpositional fronting (figure 3), which means that the particle will be fronted with the preceding noun, we see that as expected the acceptability of postpositional fronting is quite low for particles in idiomatic constructions. The particles in transparent constructions are more acceptable than the ones in idiomatic constructions. According to the Wilcoxon-test, this difference is significant for the group 1-2 with $p < .00$ ($Z = -10.273$), for the group 1-3 with $p < .00$ ($Z = -10.179$), and for the group 1-4 with $p < .00$ ($Z = -6.475$). One-way Anova is also significant for the group 1-2 with $p < .00$, $F(326.229)$, for the group 1-3 with $p < .00$, $F(301.560)$, for the group 1-4 with $p < .00$, $F(49.289)$. For the particles in transparent

constructions, we do not find a significant difference between 2 and 3. Both particles developed postpositions, but we find a significant difference with 4, which did not develop postpositions. According to the Wilcoxon-test, the group 2-4 exhibits a significant difference with $p < .00$ ($Z = -9.536$) and the group 3-4 is significant with $p < .00$ ($Z = -9.025$). One-way Anova is also significant for the group 2-4 with $p < .00$, $F(125.825)$ and for the group 3-4 with $p < .00$, $F(108.727)$. Remember that 4 are transparent particles that did not undergo the development towards postpositions. But, the postpositional fronting is still significant more acceptable here (4) than for the particles occurring in idiomatic constructions.

Figure 5.3 – Postpositional fronting



1- idiomatic verb particles
3-verb particles + postpositions

2-verb particles + pre + postpositions
4-verb particle + fronting (no postp.)

Table 5.16 : Postpositional fronting of idiomatic particles

Sentence	1	2	3	4	5	Mean
Das Stück auf führt er	18	6	3	0	0	1.4
Den Minister vor schlägt er	22	3	2	0	0	1.3
Das Bild an sieht er sich	16	10	1	0	0	1.4
Dem Mann zu hört er	15	8	4	0	0	1.6
Die Verabredung ab sagt er	16	9	2	0	0	1.5
Den Jungen mit nimmt er	13	10	4	0	0	1.7
Viel Geld ein nehmen Sie	12	12	3	0	0	1.7
Total	112	58	19	0	0	1.51

Table 5.17: Postpositional fronting of particles (Pre-, Postpositions, verb particles)

Sentence	1	2	3	4	5	Mean
Den Weg entlang gehe ich	1	10	2	12	2	3.2
Die Strasse entlang fährt er	1	8	2	13	2	3.2
Den Bach entlang radelt sie	1	5	7	9	5	3.4
Der Frau entgegen gehe ich	3	11	5	8	0	2.7
Deinene Anweisungen entgegen handelt er	1	6	7	11	2	3.3
Seiner Freundin entgegen läuft er	0	7	8	11	1	2.9
Dem Mann gegenüber sitze ich	2	9	3	12	1	3
Dem Bahnhof gegenüber steht er	0	6	5	8	8	3.6
Der Kirche gegenüber wartet sie	3	2	4	10	8	3.3
Total	12	64	43	94	29	3.2

Table 5.18: Postpositional fronting of particles (Postpositions, verb particles)

Sentence	1	2	3	4	5	Mean
Den Weg hinauf geht er	0	7	8	9	3	3
Die Strasse hinauf fährt er	2	5	8	6	6	3.3
Die Treppe hinauf rennt er	0	7	7	6	7	3.5
Den Baum hinauf kletterte die Katze	1	5	3	11	5	3.5
Den Pfad hinunter läuft er	3	4	7	12	1	3.1
Die Leiter hinunter klettert er	1	6	12	5	3	2.7
Den Dienstboten hinunter schickt er	7	9	8	3	0	2.3
Den Fluss hinunter ruderte er	1	6	6	8	6	3.4
Total	15	49	59	61	31	3.1

Table 5.19: Postpositional fronting of particles (no postpositions)

Sentence	1	2	3	4	5	Mean
Den Brief zurück schickt er	9	11	5	2	0	2
Den Weg zurück läuft er	7	8	7	5	0	2.4
Die Platten zurück gab er	9	11	3	3	1	2.1
Den Ball zurück warf er	8	10	5	2	2	2.3
Die Brücke weg riss das Hochwasser	8	12	4	3	0	2
Die Hindernisse weg räumten die Männer	8	16	1	1	1	1.9
Den Stummel weg warf er	7	14	3	3	0	2.1
Die Milch weg wischte	9	14	2	2	0	1.9
Total	65	96	30	21	4	2.1

5.13.5. Discussion

1. Particles in idiomatic constructions

While the unmarked sentences of idiomatic constructions are as highly acceptable as the transparent ones, the fronting of the particle in idiomatic constructions is significantly less accepted than for the particles in transparent constructions. This is due to the lack of contrast of particles in idiomatic constructions. The fronted particle is emphasized in contrast to the whole statement. Thus, we might say ‘Up went we the stairs’ (we went the stairs up and not down). Precisely because verb particles in idiomatic constructions are part of an idiomatic construction, it can not be contrasted (for, example we might say ‘eat up’ but not ‘eat down’). Thus, fronting does not have a complementary function in communication, since we can only say ‘eat up’ and not contrast it with other particles.

Since particle-fronting is not accepted here, by consequence, postpositional fronting is not acceptable either.

2. Particles in transparent constructions.

Let us discuss those particles in transparent constructions that did not undergo the development towards postpositions (4). We see that we do not find a significant difference in the particle-fronting compared to those particles that can only be used as postposition (3). Strangely enough, the fronting for the more grammaticalized particles (2) that can be equally used as prepositions is less acceptable than for the particles in (4). This might be due to the fact that some of the particles are not interpreted as verb particles anymore.

But, when we look at postpositional fronting, we realize that the fronting in 4 is significantly less acceptable than in 3 and 2, and that the fronting of particles in (2) are the most accepted, although the difference between 2 and 3 is not significant. This is a result that we would expect, since particles in (2) and in (3) can occur as postpositions and so their postpositional fronting should be more acceptable than in (4). Actually, the postpositional fronting expresses quite well the degree in grammaticalisation. Particles in idiomatic constructions, which cannot be grammaticalised are the least acceptable, transparent particles in 4, which do not seem to have undergone the development towards postpositions are more acceptable than particles in idiomatic constructions but less acceptable than the other transparent ones (2 and 3). And finally those particles that can be used also as prepositions (2) are the most accepted, although the difference compared to 3 is not significant. But we expected this, since in 3 postpositional fronting is usually possible in German. This is also reflected in particle fronting (figure 2), thus the more acceptable the fronting of a particle, the more acceptable would be postpositional fronting. But we find an exception in 2. Although, particles are the most grammaticalised here, fronting is less acceptable than for the other transparent structures (3 and 4). It seems that some of the particles in 2 are not considered as verb particles anymore, and function more as postpositions and prepositions, which can be also seen in figure 1 where 2 is below '5'. This would explain why then again they are acceptable when it comes to postpositional fronting.

5.13.6. Conclusion

We have seen that the frontability of particles can trigger the emergence of postpositions. We do not have to argue for a retrograde change. These postpositions usually can only occur in this position, and they cannot be center-embedded into another NP. We know from diachronic data, that once postpositions occurred, they soon turn into the prototype, which are prepositions for German. The introduction of postpositions is then not a process of further left-branching, but rather the grammaticalisation of infinite verb elements that appear in a position following the verb. The more grammaticalised items we discussed can be already prepositions, and interestingly they seem to be less acceptable as verb particles (see figure 1 and 2). This tells us that there is possibly a continuum in grammaticalisation from verb particles towards prepositions via postpositions. The more grammaticalised, then prepositions are acceptable, but verb particles tend to get less acceptable for some of these items.

This study tried to show that grammaticalisation can give us structures that seem to be inconsistent once they emerge in the language. We have to consider that they get grammaticalised from a certain position in the sentence, but finally afterwards the grammaticalised item can change and adapt to the general branching direction of the language as it happened in German when postpositions, some as in this study grammaticalised from adverbial verb particles turned then pretty fast into prepositions for the majority of the items. A retrograde change, which is then an inadequate term, can then be rather explained by processes of grammaticalisation where certain conditions have to fit.

Chapter 6

The Germanic Verb phrase

6.1. Introduction

After having discussed ‘inconsistent’ noun phrases and adpositional phrases, we will focus on the German verb phrase, which can be considered as a mixed type concerning its verb position. We will see that a mixed type can be acquired because of a cue and that this is also the reason why such a structure did not die out in language change. The German verb phrase has VO as well as OV-structures. First we will question how such structures are learnable. First, we will take a look at the general word order, and then we will see how children and second language learners acquire German. Looking at language change, we will discuss Old English, which had very similar structures to German, but which developed to a completely SVO-language. Then, we will discuss why this did not happen for German. We argue that SOVf survived in subordinate clauses is due to the infinite verb. We tested this hypothesis in an SRN-simulation as well as in two experiments, where we assumed as we will see later that the infinite verb is a syntactic cue which enables acquisition.

6.2. The verb-positioning in German

In main clauses we find three word order patterns.

122a) Hans kauft heute ein Buch (Hans buys a book today).

Hans buys today a book

122b) Heute kauft Hans ein Buch.

Today buys Hans a book

122c) Ein Buch kauft Hans heute.

A book buys Hans today

In phrase 122a) we have an SVO order, in 122b) Adv VSO (inversion because of the adverb at the beginning) and in 122c) OVS (this is possible in German because German has a case system, so position might be less crucial than in French or English). In all these examples, the finite verb (which is inflected for person, number and tense) occurs in second position, that is why languages as Dutch and German are known as verb-second (V2) languages. The subject is always attached to the finite verb, but can be positioned to the left or to the right of it (see examples 122a, 122b and 122c)

If the verb in a main clause in German or Dutch is in a compound tense (for example *hat gekauft* 'has bought'), or involves a modal verb and an infinitive (for example *kann kaufen*, 'can buy'), or is a verb with a particle attached to it (for example *ansehen* to look at) then the infinite verb (past participle, infinitive), so the part of the verb that does not have verb agreement, or verb-particle goes to the end of the clause, whilst the finite verb is nevertheless in a V2 position. This is called verb separation.

123a) *Er hat das Haus gekauft* – He **has** the house **bought**. (He has bought the house)

– past participle in compound tense

123b) *Er kann das Haus kaufen* – He **can** the house **buy** (He can buy the house)

- infinitive in modal verb construction

123c) *Er sieht sich das Haus an* – He **looks** the house **at** (he looks at the house)

– verb-particle

In interrogative clauses, we find the finite verb in V1 position. The infinite verb stays in verb-final-position:

124) *Hast du das Haus gesehen?* – **Have** you the house **seen** ? (Have you seen the house ?).

In embedded clauses introduced by a subordinating conjunction (also: subordinate clauses), in German/Dutch the finite verb, so the verb inflected for person, number and tense, appears at the end of the clause, and not in V2 position (see 123a) and 123b)).

The infinite verb precedes the finite verb (see 123b):

125a) *Er sagt, dass er die Hausaufgaben macht* - He says that he his homework **does**.
(He says that he does his homework).

125b) *Er sagt, dass er die Hausaufgaben gemacht hat* - He says that he his homework **done has**. (He says that he has done his homework).

After having seen the different word order patterns, we will see in the following, which one might be the basic word order of German. We have seen that German alters between the finite verb being verb medial and being verb final.

6.3. The basic word order of German

For example English and Russian have SVO as their basic word order but Russian can have different word orders. Odlin (1989) says that these languages vary in rigidity. He gives several Russian sentences, which are all translated by an SVO-structure in English and is translated by 'Kolja bought the car':

126a) *Kolja kupil mašinu*

S V O

126b) *Kolja mašinu kupil*

S O V

126c) *Kupil Kolja mašinu*

V S O

126d) *Kupil mašinu Kolja*

V O S

126e) *Mašinu kupil Kolja*

O V S

The flexibility of Russian word order is explained by bound morphology. The form *mašinu* signals the syntactic role of direct object, whilst a form like *mašina* signals the subject.

In German we would find in the same example ‘Kolja bought a car’ two different forms:

129a) Kolja kaufte ein Auto

S V O

129b) Ein Auto kaufte Kolja

O V S

Basic word order refers to unmarked word order, which is defined as the order, which is not bound to certain contexts, and a word order, which is not stylistically marked, especially in the case of languages with a relatively free word order, for example Latin. In German, the SVO-order of our example is unmarked, while OVS is a marked order in German main clauses, because the object is put to emphasis. But, in subordinate clauses we find an unmarked SOV-order. We also find OSV as a subordinate word order, but it is marked and much rarer. It occurs eight times less frequently than the canonical SOV-order (Bornkessel et al. (2002)). The verb occurs still in verb-final position. The object is fronted for emphasis. The unmarked word order for main clauses is SVO, since OVS and AdvVSO are marked since the object is fronted for stylistic reasons, the same is true for subordinate clauses where the object can also be fronted for stylistic emphasis. So,

since we find verb-medial and verb-final structures in German, it is not clear-cut, which is the basic word order in German.

Thus Diehl (2000) underlines that there is no consensus in the literature concerning if the basic structure of German is SVO or SOV. A majority supports SOV³⁵. Not only the fact that the finite verb appears in final position in subordinate clauses, but also the fact that in all multiple verbal complexes, as well as in V1 and V2 sentences, the lexical verb like participles in auxiliary constructions or infinitives in combination with modal verbs as well as verb-particles are in verb-final position, speaks in favour of an SOV basic structure. According to Mills (1985) however, the basic structure of German is SVO since the finite verb is in second position in main clauses and in W-questions. The frequent final verb positions in children's utterances is for Mills (1985) not an evidence for an underlying SOV-structure. According to Mills (1985), this is the reproduction of a particularly frequent input-structure of the caretakers' speech, which is the usage of modal verbs as in: *Möchtest du ein Haus bauen* (Would you like to build a house), *Du sollst nicht weinen* (You should not cry). These structures are favoured by the OP of Slobin (1973, 1985) "Pay attention to the end of words and sentences". The position of Mills (1985) does not explain the occurrence of SOV in subordinate clauses. Also according to Ross, German's deep structure is SVO on the basis of its deletion patterns in coordinate sentences. These deletion patterns are SVO SO for SVO-languages and SO SOV for SOV-languages. German exhibits here an SVO-structure (example from Lehmann (1971)), so we have:

130) *Karl reist morgen nach Berlin, Fritz nach München*

Karl goes to Berlin, Fritz to Munich.

In an SOV-language we would find then an SO SOV-structure, which I illustrate here on a Turkish example:

131) *Elif Istanbul'a, Cemil Ankara'ya gitti.* (Source: Turkish native speaker)

Elif Istanbul (directional case 'to'), Cemil Ankara (directional case 'to')went.

Cemil went to Ankara, Elif to Istanbul.

The basic word order in German is nevertheless generally considered as SOV, an order that we only find in subordinate clauses. But SOV is bound to a certain clause type, i.e. subordinate clauses as is SVO, which is bound to main clauses. According to the preceding definition of marked and unmarked word order, we have two unmarked word orders, which are bound to certain clause types: SVO for main clauses and SOV for subordinate clauses. Thus in the case of German we would not find an unmarked word order, which is not bound to certain clause types unlike in Russian. In German, we find V2, which is only possible in main clauses, where SVO is unmarked and verb-final in subordinate clauses, where SOV is unmarked.

6.4. German Word order in the Generative Approach

First of all, in the generative framework SOV is considered as the basic word order.

We find two major models in the framework of the generative grammar concerning the verb positioning of German: The first one that will be described is the Clahsen's model

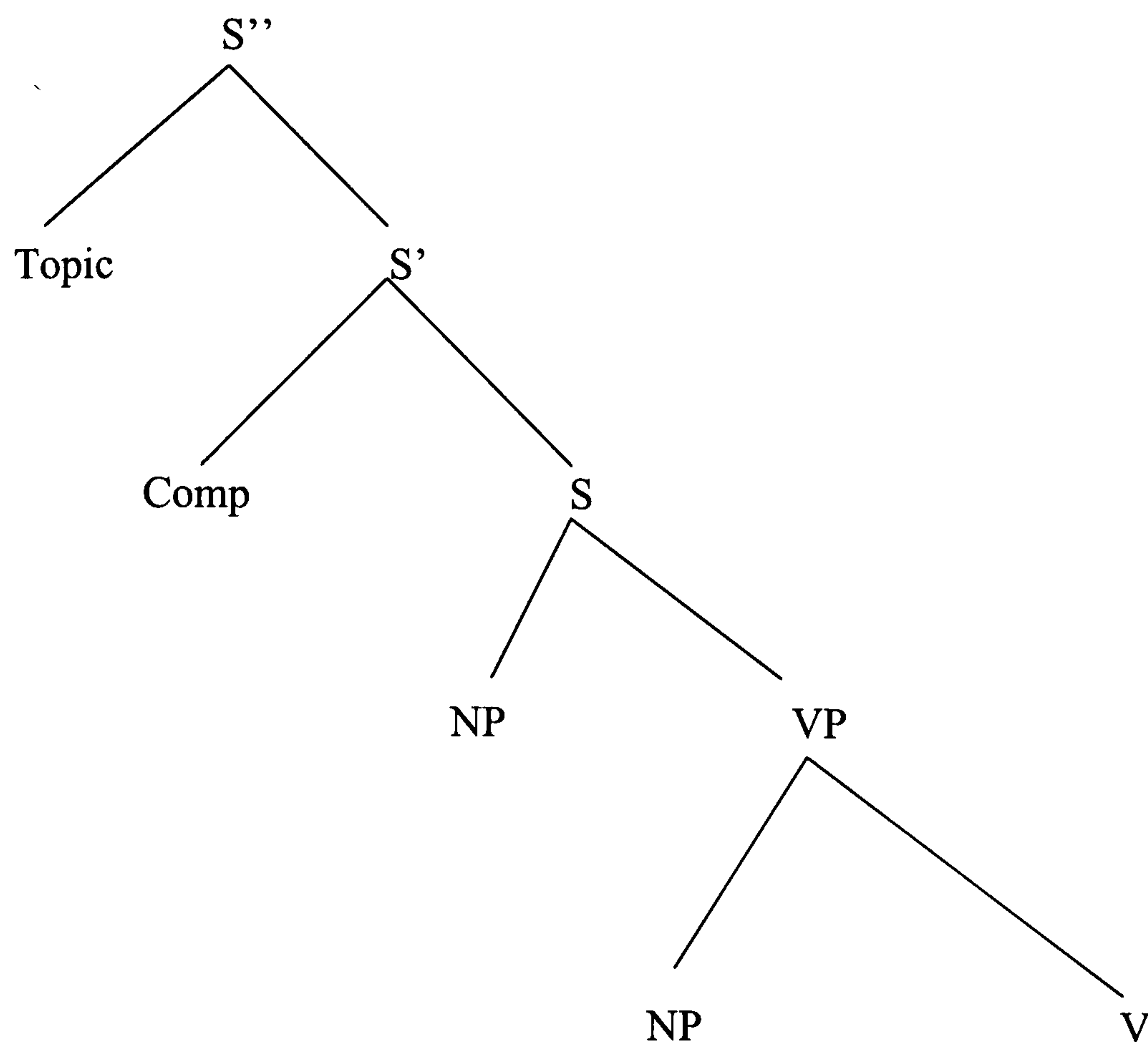
³⁵ Like Meisel (1992), Clahsen, Penke (1992), Schmidt (1996), Verris, Weissenborn (1992).

(Clahsen and Muysken, 1986) and the second one is the Travis Model (Travis, 1984).

Now let us turn to the Clahsen's Model:

DuPlessis et al. (1987) say that the analysis of Clahsen can be treated as a traditional analysis. It is supposed that at an underlying abstract level of structure – underlying structure was originally called the 'deep structure' (Chomsky 1957) and was later called the D-structure – the heads V° and I° in German and Dutch are not to the left of their complements, as they are in English and French, but to the right of their complements. The underlying order is TOPIC COMP S(ubject) O(bject) V(erb), with two obligatory movement rules in root clauses. One rule moves the inflected verb to a sentence initial COMP position, and the other moves some other element, a NP or an adverbial, into a topic position preceding the inflected verb, which gives us the V2-phenomenon. In embedded clauses COMP is filled by the complementizer and so the movement of the inflected verb into COMP is blocked, which gives us the verb-final structure in subordinate clauses.

The tree assumed by the Clahsen's Model is given below:



DuPlessis et al. (1987) give the following sentences as examples for the structures, which the tree implies and the double movement analysis:

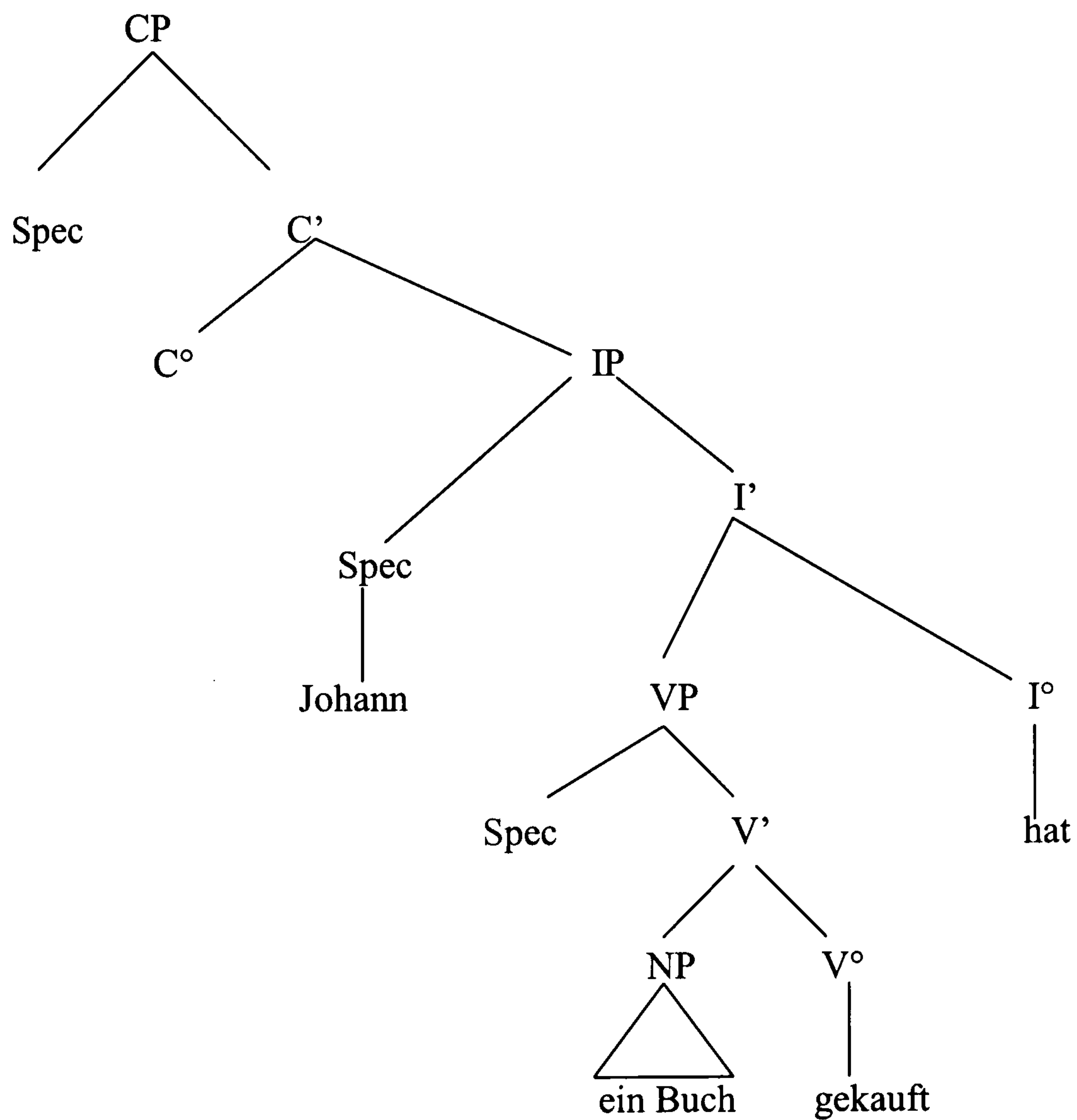
132)

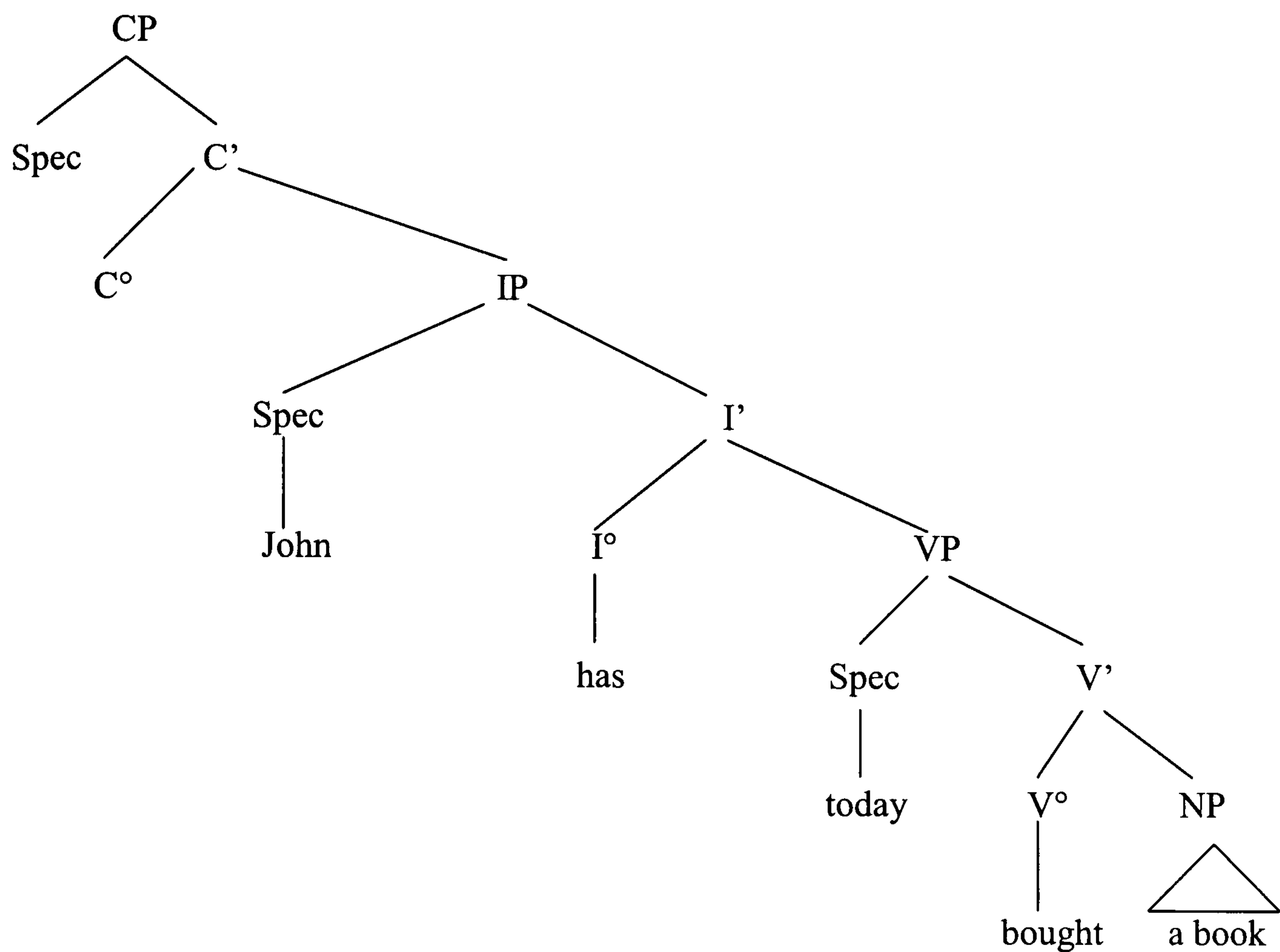
- a. [s'' Die Kinder_i [s'[COMP haben_j] [st_i[_{vp}das Brot gegessen t_j]]]]
- b. [s'' Das Brot_i [s'[COMP haben_j] [s_idie Kinder [_{vp} t_i gegessen t_j]]]]
- c. [s'' Gestern_i [s'[COMP haben_j] [s_idie Kinder [_{vp} das Brot t_i gegessen t_j]]]]

133) Ich glaube [s'[COMP dass] [s_idie Kinder [_{vp} das Brot gegessen haben]]]

Below, we reproduce a tree of Cook (1994), which adapts the Clahsen's model. This tree integrates the difference between finite and infinite verbs and adjectives and so the structures are easier to detect in the tree. S'' is replaced by CP, S' by C' and S by IP. These terms are more common in the GB-framework. The first tree represents the German D-structure after the Clahsen's analysis and the second tree the English D-structure.

German



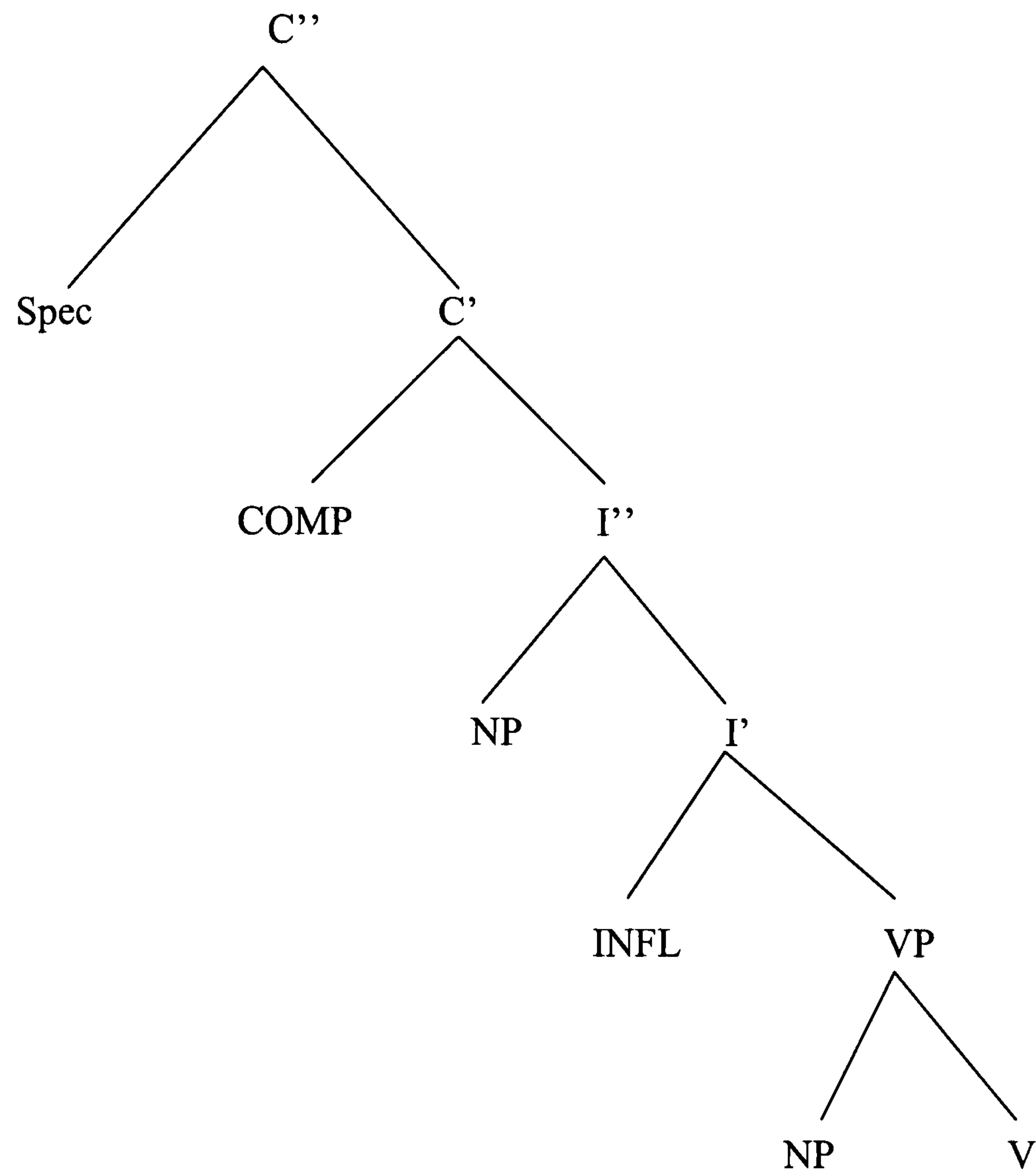


In the Clahsen's analysis, we are confronted with the interaction of two parameter settings in German: the first is the Headedness parameter, which is set head-final in the German verb phrase (VP), i.e. OV. The second is that the value of C° ³⁶ in German is fixed to attract the tensed verb in all root clauses, unlike the Romance languages and English, in which the value of C° is fixed to attract the tensed verb only in questions and with certain specific adverbial items in some of these languages as in English: 'Never would I have done it':

³⁶ C° means complementiser. C° determines the kind of clause it is: whether it is a root clause or an embedded clause; whether the clause is a declarative or an interrogative. Thus C° has the features [+ / - root] and [+ / - wh] (where [+ root] = root clause, [- root] = embedded clause, [+ wh] = question, and [- wh] = declarative).

b) The Travis Model

The tree of the Travis Model is the following:



In this account, the verb may appear in three positions: in the V, in INFL, and in COMP. DuPlessis et al. (1987) give examples of these three possibilities:

134a) [_{cp}dass [_{ip}die Kinder [_{i'} e [_{vp}das Brot gegessen *haben*]]]]

134b) [_{ip}Die Kinder [_{i'}*haben*_j [_{cp}das Brot gegessen _{t_j}]]]

134c) [_{cp}Das Brot_i [_{c'}*haben*_j [_{ip}die Kinder [_{i'} _{t_j} [_{vp}_{t_i} gegessen _{t_j}]]]]]]

While in the Clahsen's Model, the verb appears in two positions, it can appear in three positions in the Travis Model. In the Clahsen's Model there is no difference between subjects and non-subjects like pre-posed elements like adverbials or objects, while in this model both phenomena are treated differently. In sentences with an initial subject as in 7b, the verb moves to INFL, while in sentences with a pre-posed non-subject as in 7c the verb has a double movement. First it moves to INFL and then to COMP. Non-subjects move into Spec CP, while subjects appear in IP. In subordinate clauses as in 7a) the verb stays in its D-structure position like in Clahsen's Model. These differences between subjects and non-subjects compared to Clahsen's Model implies as Jordens points out that "the relation between SOV and SVO structures on the one hand, and SOV and XVSO on the other is the result of an acquisitional process which takes place at different stages of linguistic development". After Clahsen's analysis, both VP and IP are head final, while here in Travis' analysis only VP is head final. We find these differences in Travis' account because of the Empty Category Principle (ECP), which means that empty categories have to be governed properly. In embedded clauses in German the verb cannot move into INFL. This means that COMP must be a proper governor. In English however, COMP does not properly govern, therefore INFL cannot remain empty.

6.5. Verb-Particles and underlying word order

Particles are an indicator of verb-final word order when they precede directly the infinite verb in main clauses in combination with an auxiliary verb (a) and appear in sentence-final position in main clauses when only a finite verb is present (b). In subordinate clauses particles precede the infinite verb (c) or the finite verb then only when an infinite verb is not present (d). This is illustrated below with examples of German:

A) Er ist gestern **heim**gegangen

He is yesterday homegone

Yesterday he went home

B) Er geht heute **heim**

He goes today home

He goes home today

C) Er sagt, dass er gestern **heim**gegangen ist.

He says that he yesterday homegone is

He says that he has gone home yesterday.

D) Er sagt, dass er gestern **heim**ging.

He says that he yesterday homewent

He says that he went home yesterday.

So, as we can see the particle stays in German throughout in the d-structure and no movement occurs for the particle as it is the case for the infinite verb.

6.6. Stages in the Acquisition of German verb positioning in the L1

Here, we will see how children acquire German word order, and especially in which order they acquire it. This is important since it could tell us more about how children acquire a different word order in main and subordinate clauses.

Clahsen and Muysken (1986) derived four developmental stages from earlier studies:

- I. *No fixed order*; finite and non-finite verbs occur both in verb second and in sentence final position, but with preference for the verb final position about 60-70 per cent of the time; for example, “Ich Schaufel haben” (I shovel have)
- II. *Non-finite verbs occur regularly in final position*, for example, “Deckel drauf tun” (cover-on-put); finite verbs occur in both verb seconds and final positions with preference for final position. In other words, the children are starting to restrict the non-finite verb to its correct position, since finite verb forms in final position only occur in subordinate clauses.
- III. *Finite verbs occur only in second position*, for example, “Die Schere hat Julia” (The scissors has Julia), and the finite auxiliary forms and the non-finite main verb are separated in the word order, for example, “Ein Schiff muss du erst

bauen” (A ship *must* you first now *build*). The children have acquired verb movement; Verb second increases from 40 per cent to 90 per cent over a month.

IV. *Finite verbs occur in sentence final position in subordinate clauses*, as soon as such clauses first appear, as in “Guck was ich in mein tasche hab” (Look what I in my pocket have). This stage is strikingly error-free and so confirms that children ‘make use of learning strategies *specific* to the language acquisition device’ (Clahsen and Muysken, 1986, p. 103), that is, UG.

The first stage can be explained by the simple fact that the child finds in its input verbs in both positions: finite verb in second position and even in the first (questions) and in final position in subordinate clauses. The child encounters the infinite verb also in final position. The child has not yet acquired subordinate clauses. Infinite verbs do not have an agreement pattern. So, one possible hypothesis might be that the learner acquire more easily infinite verbs because of 2 reasons: Infinite verbs do not have an agreement pattern, so learners only have one single form to learn. These forms occur in final position of the VP and children better memorise these forms, since such forms are heard at the end of a phrase in root clauses. If we remember the initial-finalisation strategy, this could be due to strategies concerning memory constraints that one remembers best, what was at the end or at the beginning. An additional reason for the predominance of verb-final structures could also be in the caretaker’s speech. According to Klein, who studied first language acquisition in Dutch, the word order in the child speech reflects the word order in the input language. In the caretaker’s speech we find utterances as SAOV³⁷, ASOV, AOV and OV. This should explain the OV preference in the children’s

³⁷ A for auxiliary

speech. According to the small clause hypothesis children's clauses are VPs, which means here that the child first master object+infinite verbs.

In the second stage, the finite verbs occur still in both position but with preference for final position, but particles and infinite verbs are only in final position. So we can say that children set in the first two stages the language verb-final. Then, in the next stage, the finite verb form appears only in second position. This makes the verb separation possible, since the learner acquired non-finite verb forms in final position in the previous stage. The learner has set the language verb-final and everything that is verb-final in the input will stay in this position. So as soon as the L1-learner acquires finiteness, finite verbs appear only in V2-position. We can explain this by the fact that after initialisation-finalisation structures have been acquired, the L1-learner moves to positions in the middle of the phrase. But also the acquisition of finiteness must be linked with the occurrence of the right position of the finite verb. Verb separation is acquired simultaneous, i.e. that the infinite verb, which lacks finiteness stays in final position.

Finally, the L1-learner acquires subordinate phrases and since the final position for infinite verbs was acquired before, the finite verb can appear in the child's utterances in verb final position and that is why this stage is strikingly error-free (Mills (1985), Rothweiler (1993), Weissenborn, Berman (1991), Meisel/Müller (1992) and Berman, Weissenborn (1991). This stage is said to be error-free and we should ask why if we consider that foreign language learners (especially those of SVO languages like French or English) commit a lot of mistakes concerning this aspect.

Compound verbs such as the present/past perfect, where we have an auxiliary verb ('to be / 'to have') are acquired later in subordinate clauses. As long as there is only a single

finite verb, the acquisition of the subordinate clause structure is acquired without any problem by the child. When children are confronted with complex predicates in subordinate clauses as [[past participle] auxiliary] or [[infinitive] modal verb], the child either replaces the complex verb with a single verb or reverse the order of the sequence [[verb] auxiliary]. According to Mills (1985), this is problematic till the age of 4 and will not be mastered correctly till the age of 6.

According to Pienemann and Johnston (1987), the learner distinguishes between beginnings and endings of strings. These are specific processes in second language acquisition. If these processes might be similar in first language acquisition, this explains why the learner has a preference for verb final positions. The learner remembers better strings at the end of sentences, than strings in the middle of sentences like verbs occurring in V2 position. This is caused by constraints on memory according to initialisation-finalisation strategy. It might be possible that the learner acquires earlier V2 than the final position of the finite verb in subordinate clauses because this structure is more frequent and necessary for further language acquisition. We have seen that verb-final structures are first acquired in first language acquisition and that the infinite verb is final in German. In the following we will discuss if the infinite verb might help children realise that German is a verb-final language and more specifically that the finite verb in subordinate clauses is final. For that we have to postulate that the infinite verb is a cue that helps children setting the verb phrase final.

6.7. The Generative framework and stages of L1-acquisition

According to UG, the German verb phrase is head-final. The UG-based-parameter approach is supposed to express the intuitions of the native speaker. As mentioned, the D-structure is supposed to be SOV. But before an L1-learner acquires final position of finite verbs in embedded clauses like subordinate clauses, V2 is acquired and the acquisition of the final position of finite verbs in subordinate clauses constitutes the last stage in the acquisition task of an L1-learner.

From a UG point of view, it could be unclear why children first acquire V2 because this is the surface structure, which demands movement of the inflected verb from I° to C° . It could be more logic if children first acquire verb final, which is the underlying D-structure and further on acquire the surface structure, which should be more difficult because a movement is applied and the D-structure should be more accessible. In favour of UG speaks indeed the fact that verb final structures are acquired before V2 and verb separation, which are acquired simultaneously, which could be an indicator of a head-final underlying rule, if we consider this as an argument that early verb final appearances are due to a 'verb-final parameter setting'. But this could be also explained by cognitive constraints, like finalisation strategy (Slobin 1973, 1985), which states "Pay attention to the end of words and sentences". Further on, we will discuss the role of the infinite verb in language acquisition

6.8 The infinite verb as a syntactic cue in German

First, we should define the term ‘syntactic cue’ more closely. According to Dresher (1998), UG specifies not only a set of parameters, but for each parameter a cue. Cues are grammar fragments, which contain the necessary information for guiding the parameter setting. Our hypothesis is that the infinite verb is the syntactic cue for the child to acquire that I is final in the d-structure. According to Lightfoot (1991), a degree-0 learner resolves the verb-order option on the basis of unembedded data which reveal the position of the verb. These data can be the position of separable particles, negation elements, certain adverbs and infinite verbs, each of which mark the position of the underlying position of the verb. Thus in German, infinite verbs and separable particles follow the object:

135) Ich habe die Frau gesehen

I have the woman seen

‘I have seen the woman’

136) Er kennt den Mann nicht

He knows the man not

‘He does not know the man’

While infinite verb elements are acquired quite early in first language acquisition, finite verbs are acquired later. Evers and van Kampen say for the L1-acquisition of Dutch that “for a period of 300 days and a few thousand examples of input V-second structures a

day, more than half a million examples were needed to adapt the child's system and to reach acquisition point". The distribution of verbs in the subordinate is rather different from the distribution in the root clause. Nevertheless, the acquisition of the subordinate pattern is instantaneous after verb positioning in the main clause has been acquired. All examples of subordinates appeared just after the V-second acquisition point, and none of them failed to have the correct verbal distribution according to Evers and Kampen.

Subordinate clauses are much less frequent than root clauses, and apparently acquisition is instantaneous and unproblematic for Dutch. As we have seen before, the same was said for German. Since the finite verb is medial in root clauses, we need a syntactic cue for explaining its acquisition. The appropriate syntactic cue is the infinite verb in root clauses. The infinite verb appears in final position. It is lexical, which is an advantage since lexical structures precede functional structures (for example finiteness is acquired after lexical forms of verbs are acquired). According to the small clause hypothesis, postulated by Radford (1990), children's clauses are VPs. The VP consists of the infinite verb and its complement. Since the infinite verb is lexical, the early grammar is a lexical-thematic system, in which lexical items project according to the X-bar structure, and in agreement with the Projection Principle, which states that lexical information is syntactically represented. The counter-hypothesis of the small clause hypothesis is the Full Competence Hypothesis (Poeppel, Wexler, 1993), which states that finite and infinite verbs are distributed differently in children's clauses with respect to other clausal constituents. This discrepancy is unexpected under the small clause hypothesis. In favour of the Full Competence Hypothesis speak studies that learners of Dutch, German, French and Swedish also produce a fair number of finite clauses. Children treat finite and infinite verbs differently. For example, finite verbs precedes negation, while infinite verbs follow it (for German and Dutch see De Haan and

Tuijnman (1988); Weissenborn (1990); Verrips and Weissenborn (1992); Poeppel and Wexler (1993). Thus children would never produce a finite verb in final position in a main clause:

- *Johann ein Buch kaufte – Johann a book bought

So, children distinguish from the very beginning between finite and infinite verbs and reserve finite verbs for second position and infinite verbs for final position. Although children never produce finite verbs in final position in main clauses, they produce till the age of 3 ‘root infinitives’, these are main clauses containing an infinite verb, rather than a finite one. This was observed in languages such as Dutch, Danish, German, Russian and Swedish. The presence of ‘root infinitives’ challenges the view of the Full Competence Hypothesis. Only lexical verbs but not auxiliaries can show up in Root Infinitives Clauses. Further on, they do not occur in pro-drop languages, and they cannot be introduced by a non-subject in V2-languages.

According to Roeper and Weissenborn (1990) and Penner (1993), awareness of the subordinate structure would help analysing root sentences. This suggestion does not make much sense if we consider that finiteness is acquired later as are infinite verbs and that main clauses are also acquired earlier than subordinate clauses. The statistic evidence would not be enough since subordinate clauses are significantly less frequent than main clauses. Further on, children, as we have seen, do not produce any finite verbs in final position before they produce subordinate clauses. Other evidence for the role of the infinite verb and the d-structure of I we find in English language change, where OV changed towards VO.

When we discuss that the infinite verb is the syntactic cue, we also have to discuss to which extent a syntactic cue is sensitive to frequency. The question that first arises is if grammaticality is independent of frequency.

Frequency can support learning, and especially there where grammatical items are in opposite distribution and grammatical competition could take place if items were too infrequent to give enough evidence. Subordinate clauses have a different word order than main clauses. In many languages subordinate clauses have the same word order as main clauses and since subordinate clauses are infrequent, there must be a grammatical cue, which is frequent enough, to trigger the acquisition of SOV-subordinate clauses when main clauses are SVO. Our hypothesis is that final infinite verbs in main clauses act as the cue for acquiring finite verb-final structures in subordinate clauses. According to Slobin's Operating Principle D, children tend to avoid discontinuous structures (Slobin (1973)). Since SVfOV_i is a discontinuous structure it should be more difficult to acquire. But children produce infinite verbs quite early, and when finiteness is acquired, verb separation does not seem to be difficult to acquire.

So, children start with VPs only containing an infinite verb and later on when they learn finiteness the discontinuous structure is completed. So, children might learn discontinuous structures because they learn it in two steps and they start with infinite verb forms because they are easier due to the absence of finiteness. According to Lightfoot (1999), cues occur in simple data in unembedded domains. Embedded domains, so Lightfoot (1999), "are as likely as unembedded domains to reflect the usual to-ing and fro-ing of the chaotic linguistic environment, but they have no effect on the development of grammars in children". In the case of the L1-acquisition of German, children first learn infinite verbs, which are simple data, since they do not have an

agreement pattern, and acquire thus verb-final positioning of the verb before they learn that finite verbs are in final position in embedded clauses” (subordinate clauses).

Infinite cue and aphasia

Aphasic patients also have a preference for producing infinite verb forms because often finiteness is impaired in those patients. Mimaceli et al. (1983) describe an Italian aphasic, and Berndt (1987) describe a Dutch-speaking aphasic. Both patients produce a high number of infinite verb phrases. Further on, Dutch agrammatic patients usually use inflected verbs in verb second position, while verbs in final position generally remain uninflected (Kolk & Heeschen (1992), Bastiaanse & van Zonneveld (1998), Bastiaanse et al. (2002)). Similarly, children first use final verbs in final position and use then inflected verbs only in verb second position till subordinate structures are acquired. According to Kolk (2003), the preference for non-finite verb phrases by Dutch agrammatics could be due to a strategy that he calls “syntactic simplification”, which basically prevents computational overload. It consists of selecting simple clauses without embedding and phrasal complexity. Agrammatics prefer thus producing non-finite verb phrases, which either lack a phrase or have a verb in the infinitival or past participle form. These frames, so Kolk, “are also selected when normal speakers make use of elliptical constructions. Recent evidence indicates the same limited set of elliptical constructions occur in grammatical speech, normal ellipsis and the speech of young children (Kolk (2000))”. This must mean that non-finite clauses require less grammatical work. A PET study by Indefrey et al. (2001) indicates indeed that non-finite clauses require less grammatical work in native German speakers. So, we have seen that infinite verbs play a facilitating role in first language acquisition, in aphasic speech, and in normal speech for pragmatic reasons, especially for elliptic constructions.

Infinite cue in bilingualism

The German infinite verb can also be easier or more dominant in the case of bilingual acquisition. Ronjat (1913) described the speech of his son who grew up in a French-German speaking environment. Between age 3 and 4 he transferred the position of German infinite verbs and even introduced discontinuous structures. Here some examples:

137) *un bateau faire*

a boat make-Inf.

138) *maman sait de très jolies choses peindre*

mama knows very beautiful things paint-Inf.

6.9 The infinite verb in language change

In language change, we can get further evidence for the role of the infinite verb. If we assume that the infinite verb is the cue for acquiring finite verb final positioning in subordinate clauses, then we could examine what happens if the infinite verb final cue is not as solid anymore. As we will see in the following, this happened in Old English.

a) Old English

Old English had a development from an OV-language towards a VO-language

Table 6.1: OV towards VO in Old English

	c. 1000	c. 1200	c. 1300	c. 1400	c. 1500
Accusative object before verb	52.5%	52.7%	40+%	14.3%	1.87%
Accusative object after verb	47.5%	46.3%	60-%	85.7%	98.13%

Source: based on Fries (1940: 201)

In the following, we will see in more detail how these changes occurred.

Root clauses

In a schematic way, we find the following word orders in Old English root clauses.

In early stages of Old English we also find SOV in main clauses as in:

a) S O V

He Gode þancode [Lightfoot'(1991)s (24c)]

But in general we find the following word orders b) to d):

b) S V O

He geseah þone mann

'He saw the man'

c) V2-Structures

Adv V S O

þa sende se cyning þone disc

Then sent the king the dish

‘Then the king sent the dish

In Old English we find a V2-structure, but also a V3 structure.

We find SOV in root clauses in combination with pronouns as in c):

d) S O V

Heo hine laerde

She him advised

‘She advised him’

Structure b) and c) in combination with infinite verbs can have two different OV structures:

1) VfOVi

2) VfViO

So the infinite verb can occur in two positions.

The infinite verb is most times in final position as well as verb particles. So, the VP is OV; V being the infinite verb. Structure d) does not exist any more in modern Germanic

languages, but we still find it in modern Roman languages such as French in constructions with clitic pronouns.

The infinite verb is generally in final position as it is the case for German and Dutch and as in German we find particles in final position (see e)). So we have another hint that the particle can function like the infinite verb in Old English:

- e) *þa sticode him mon eagon þa ut*
then stuck him someone the eyes out
'Then his eyes were put out'.

Subordinate Clauses

We find three different word orders in Old English (Pintzuk)

- a) Subj. – Obj. – V_{infin} – V_{fin} (like modern German Subordinate Clause)
- b) Subj. – V_{fin} – Obj. – V_{infin} (like German root clauses, infinite verbs in sentence final position).
- c) Subj. – V_{fin} – V_{infin} – Obj. (like modern English word order).

In a) and b) the infinite verb is in final position so the VP is OV, V being the infinite verb³⁸. The finite verb can be in sentence-final position (so head-last) as in a), while in b) we have an inconsistency because the VP is head last but the IP is head-first. According to Kiparski (1995) Old English does not have a complementiser, so the movement from I to C is not prohibited in subordinate clauses since it is not blocked as

it is for German or Dutch. So we find even in Subordinate Clauses structure b) which in German is only found in root clauses. Structure c) in Old English subordinate clauses does not give us a clue about an apparent OV-structure, but is rather analysable in VO-terms. In modern West Germanic languages as Dutch or German we always have an SOV-structure in subordinate clauses and so we would not encounter structures as SVfOV_i and SVfViO, while the latter one is the more problematic one because of the lack of evidence for a verb-final language.

After having seen which structures can occur in Old English subordinate clauses and main clauses we will try to order these phenomena in looking at the distribution of finite and infinite verbs in the following.

6.10 A “Syntactic Hole”

Although we find variation in Old English of both the finite verb Vf and the infinite verb Vi, in the sense that both can appear in medial and final position, finite verbs can only appear in final position when the infinite verb is in final position or put in another way the finite verb cannot occur in final position when the infinite verb is in medial position.

So, the fourth possible word order does not appear in Old English:

d) Subj. – V_{infinite} – Obj. – V_{fin}

Structure d) does not seem to appear in any natural language (Steele (1975)).

³⁸ As already said for the root clauses, the particle takes the same position as the infinite verb.

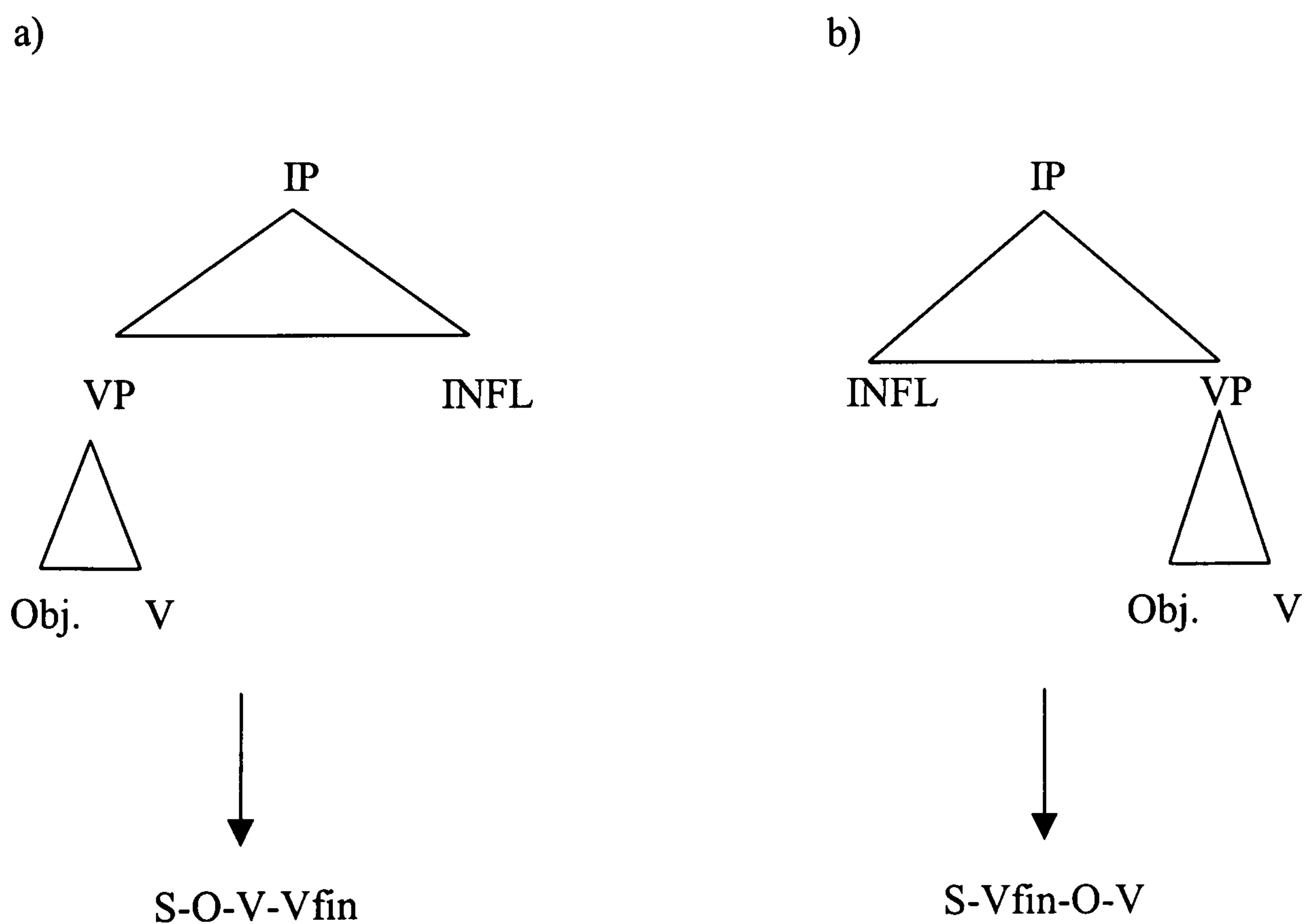
Two of the three structures could fit into a verb-final language. These are structures a) and b). In a) we find the classical SOV-structure that we also find in German subordinate clauses. In b) we find the infinite verb in sentence final position and the finite verb in a V2 (sometimes V3) structure. So, we find the word order in Modern German subordinate clauses in a), the word order in Modern German root clauses in b) and finally the Modern English word order in c).

According to Steele (1981), the evolution of English went through the following stages:

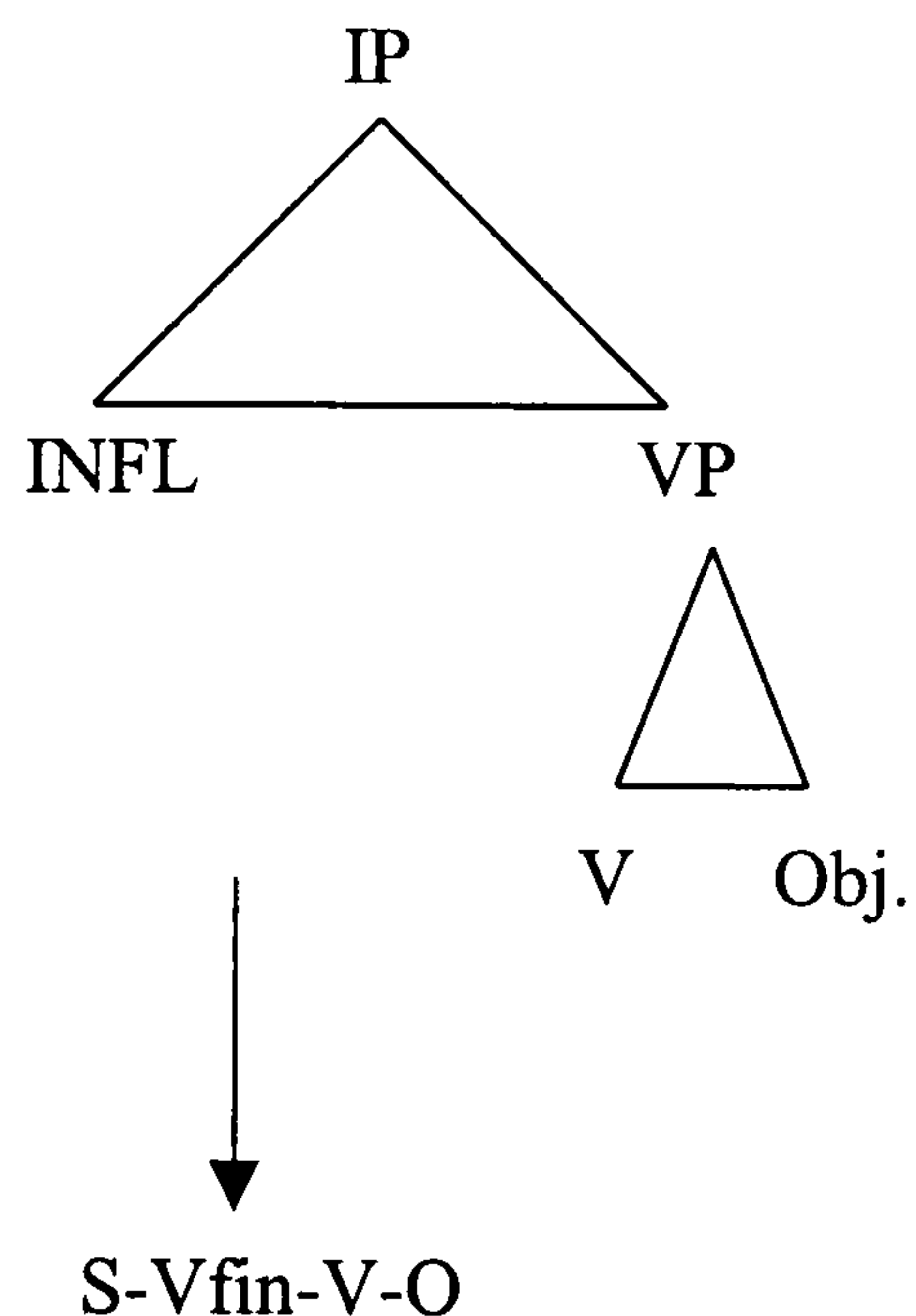
SOV_iV_f -> SV_fOV_i -> SV_fViO

Pintzuk's data as we have seen above seem to confirm this hypothesis.

If we observe the following structures we can observe a sequence from left-branching towards right-branching from a) to c)

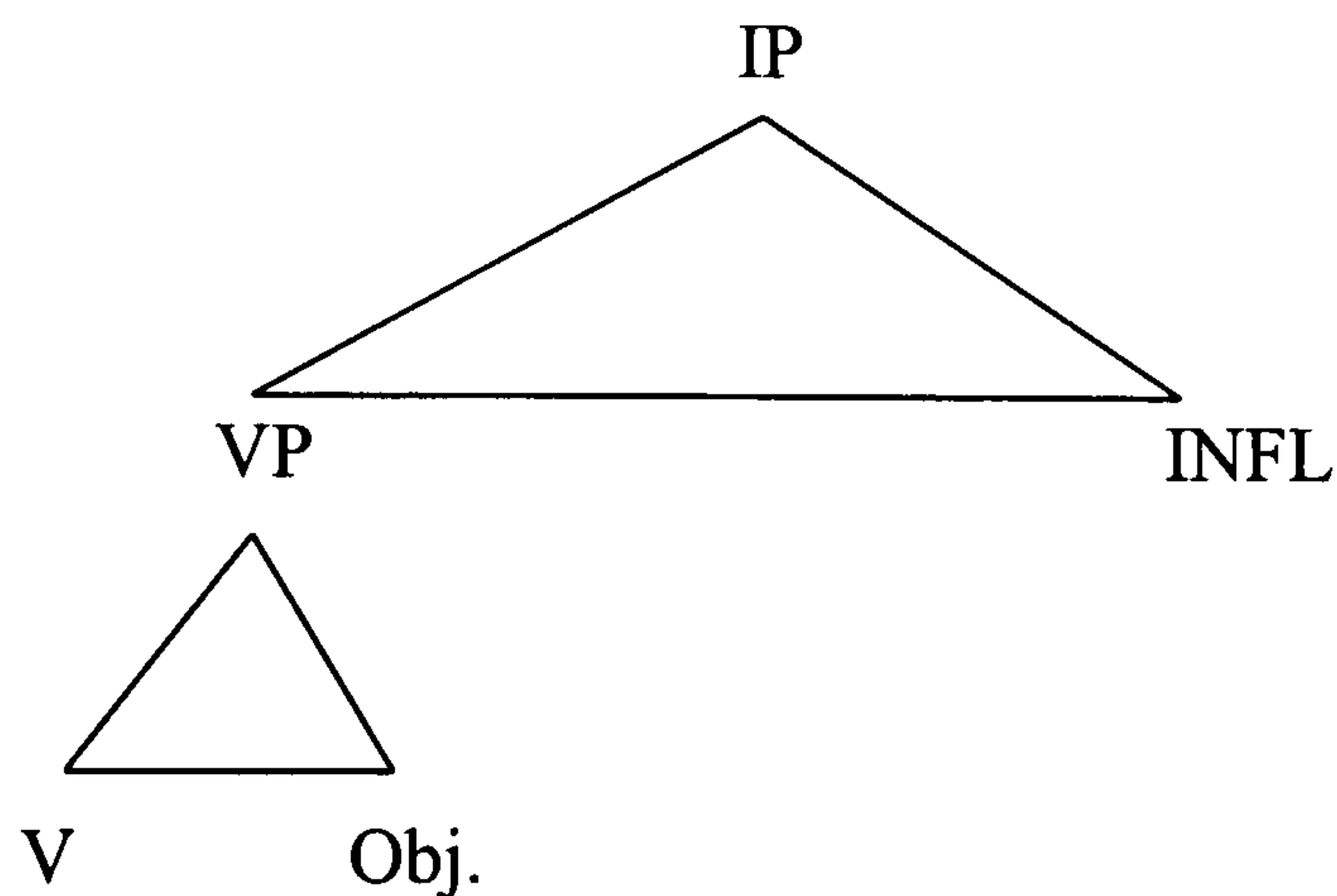


c)



So, if we take example a), we have a ‘total’ head last verb structure. The verbal phrase (VP) is left-branched. So, the infinite verb is in final position in the VP. We still find this construction in modern German languages like German, Frisian etc. in subordinate clauses. In example b), we are confronted with the right branching of the IP-constituent. But the VP is still left branched. The infinite verb is still in final position of the VP. Such a surface structure, we find in modern Germanic languages as in German, Frisian or Dutch root clauses. In c) we have a further right-branching, this time of the VP and we lose verb-final structures. We are here confronted with a total SVO-structure as in Modern English. Let us consider in the following structure d), which is not possible in natural languages:

d)



In d) we are confronted with an inconsistency, triggering center-embedding, as in b). Structure b) is possible but d) does not occur in any natural language. In structure d) the IP is left-branched, but we have a right-branching in the VP-constituent. So, the infinite verb (V) is not last in the VP-constituent. It is not possible to learn such a grammar because the grammar implies that the finite verb is in final position and that the structure is head-last. For learning that the finite verb is in sentence-final position the infinite verb must be in final position in the VP-constituent. So right-branching has an order here³⁹. First the higher constituency change than the lower one. So before right-branching can occur in the VP, the right-branching has to occur in the IP constituent as in b), as indeed it happened in Old English as we have seen earlier. Remember that medial finite verbs are more frequent than medial infinite verbs.

³⁹ This might be limited to phrase structures, which are in relation to each other. Here the IP, which has as an head the I, which takes the finite verb and the VP, which is the complement, has as its head the infinite verb. So the whole verb structure is governed by the IP, which has as its complement the VP.

Only after that a further right-branching in the VP-constituent can occur. This means that the infinite verb must be the syntactic cue for acquiring a verb-head-final language like German. A language, which has b) must have a). I will illustrate this at the example of first language acquisition. Children first acquire infinite verbs and use verbs first in sentence final position. Root clauses like b) are much more frequent than subordinate clauses. So children first acquire the VP and learn that the infinite verb is in VP-final position. It might be that children use b) because the infinite verb is in sentence-final position as well. In a) this information would be more difficult to extract since the VP is not in final position and the INFL follows the VP. So, the child learns first the VP (VP being Object Infinite verb) in root clauses where the VP is final and the finite verb in second position, i.e. the infinite verb is separated from the finite verb and the child can easily extract the information that the VP has a head-last structure. So, the first thing that children acquire is the VP. A similar phenomenon can be found in Broca's aphasics. German-speaking Broca's aphasics often produce infinite verb forms like infinitives or participles in root clauses where a finite verb form is required. These infinite verb forms are generally placed in sentence final position. So, children produce infinite verb forms in root clauses in final position (Phase I) and aphasics who lost parts of their language abilities produce also infinite verb forms, which they also place in sentence-final position. This correlation is a well known fact (or observation) in psycholinguistics. Ribot (1881) said that the language capacities that are acquired first in childhood are also generally those that the aphasic patient loses last. So, this also tells us that the infinite verb might be an important cue in the acquisition of German.

Now, let us return to structure d) which is not possible in the world's languages. If this branching is not possible in this structure but in other structure, we might say that this is a syntactic hole.

IP+VP	VP+PP
<p>a)</p> <pre> graph TD IP --> VP IP --> I VP --> N VP --> V </pre>	<p>a)</p> <pre> graph TD VP --> PP VP --> V PP --> N PP --> P </pre>
<p>b)</p> <pre> graph TD IP --> I IP --> VP VP --> N VP --> V </pre>	<p>b)</p> <pre> graph TD VP --> V VP --> PP PP --> N PP --> P </pre>
<p>c)</p> <pre> graph TD IP --> I IP --> VP VP --> V VP --> N </pre>	<p>c)</p> <pre> graph TD VP --> V VP --> PP PP --> P PP --> N </pre>
<p>d*)</p> <pre> graph TD IP --> VP IP --> I VP --> V VP --> N </pre>	<p>d)</p> <pre> graph TD VP --> PP VP --> V PP --> P PP --> N </pre>

Table 6.2: Syntactic Hole?

We have inconsistencies in structures b) and d), d*). But structure d*) does not exist with an IP+VP-structure in the world's languages, but the same branching exists with VP+PP. The answer might be that both IP and VP govern verbs, I the finite and V the infinite, and so we cannot learn such a structure if the V is not verb-final as already

discussed. So, it is not a branching, which is excluded but a specific structure. We can easily explain an inconsistency like d) with VP+PP, since we can say that such a structure exists in German subordinate clauses.

Our thesis is if right-branching d*) does not exist, but the branching itself is not excluded (see d)), the infinite verb must be a syntactic cue which enables the learner to predict that the finite verb ('I') can be final. The finite verb cannot be final if the infinite verb is not final if the infinite verb is a cue, which assists learning.

6.11 Why did German not develop towards a basic VO-language?

As it is the case for German, SViOVf cannot occur. In contrast to Old English, the infinite verb cannot occur in medial position. So, German does not show grammar competition between OV and VO, in the sense it did in Old English. In the following, we will see that Germans prefer SVO, although SOV is produced in subordinate clauses, which are less frequent than main clauses. Why did German then not evolve towards a total SVO language. As already outlined for Old English, we will establish the infinite verb as a syntactic cue.

6.11.1. Apparent preference for SVO in German

In German root clauses we find a V2-construction with a preference for SVO-structures. Weyerts et al. (2002) found that native speakers of German prefer processing finite verbs in second position after the subject and before the object, i.e. SVO. The authors found in three reading-times experiments that sentences with the finite verb in second position and immediately following the subject are easier to parse than sentences in

which the verb is in final position. This also holds for embedded clauses for which the German syntax requires sentence final position of the verb. The authors found that “embedded clauses with ungrammatical SV_fO word order did not produce longer reading times compared to embedded clauses with correct SOV_f order and main clauses with correct SV_fO word order. By contrast, reading times for main clauses with ungrammatical SOV_f were significantly slower compared to grammatical SV_fO in main clauses and grammatical SOV_f in embedded clauses”. So, SV_fO word order is preferred over SOV_f in on-line sentence comprehension. The authors did not find a difference between content and auxiliary verbs, which indicates after the authors that the SV_fO preference is caused by the morpho-syntactic features (finiteness) of verbs rather than by their lexical-semantic properties. The authors argue that SOV-sentences have higher memory costs. Then, a finite verb is predicted once the subject is encountered, and this needs to be retained in working memory while the object is processed. Thus, SVO sentences are likely to consume less memory space than SOV structures⁴⁰. According to the frequency counts available to these authors, 74% of the sentences had a finite verb in second (or first) and only 26% in clause-final position. Lightfoot (1997) claims that “about 70% of Dutch, German, Norwegian and Swedish sentences have the surface order SVO in matrix clauses. Now, let us see which word order German and Dutch aphasics prefer. First, we have to discuss the hypothesis and then we will see further on the evidence we find in the literature.

⁴⁰ This explanation is unsatisfactory. If SOV takes more memory space, why then did it evolve in the first place and why is it the most frequent structure in the world’s languages. By the way, this second argument in saying that it is very frequent in the world’s languages is not a good argument, since when a structure exists, it must be totally learnable since any language can be learnt by any child who grows up in a certain society. But in the literature of language universals people often argue with respect to the frequency a structure occurs in a language. But back to the issue, if SOV has higher memory costs, why is it so predominant and why do people even assume that it used to be the word order of the first language (Proto-language) (see Newmeyer).

According to the tree-pruning hypothesis of Friedmann and Grodzinsky (1997), aphasics who have an impairment relatively high in the syntactic tree, at the level of the complementizer node could lead to an inability to produce embedded clauses, but main clauses with their attendant grammatical morphology could be intact. Friedmann and Grodzinsky (1997) came to this conclusion when they observed that aphasic patients commit more tense than agreement errors. According to the generative framework, finite verbs have to move from their base-generated position to nodes representing inflection to collect or check their inflection as we have illustrated it for German. The tree-pruning hypothesis of Friedmann and Grodzinsky (1997) assumes that tense and agreement are represented in two different nodes, the node related to agreement being located lower than the node related to tense. If this is the case, we should expect that aphasics have problems producing correct main clauses since the complementizer is higher than the tense node and the finite verb cannot move to the complementizer in main clauses. So, according to this hypothesis, Dutch and German aphasics should have a preference for SOV-order. Kolk (2003) tested this hypothesis. 8 Dutch speaking Broca-aphasics were tested on main clause production. The aphasics had an equal preference for SVO and XVSO-order (44.7% and 39.5% respectively). The SOV-order was only rarely chosen (4.4%, and only two patients contributed to this percentage) and all SOV-productions consisted of infinitives. The difference between SVO and XVSO was not significant, and the difference SVO, XVSO was however significant. Although the tense errors in XVSO and SVO were nearly identical, fewer agreement errors were made in SVO compared to XVSO (16.2 and 27.5% respectively). So, as we can see here, aphasics prefer SVO and XVSO-sentences, although an SOV-order is predicted. Kolk et al. (2003-4) extended this experiment in including embedded sentences where an SOV-order is expected. The assumptions of the tree-pruning hypothesis are that in

SVO and XVSO the correct word order is blocked since the finite verb cannot move to the complementizer, but when an SOV is required the correct word order should be produced. The authors did not find a preference for SOV. XVSO order elicited more word-order errors than either SVO or SOV, but this difference was not significant.

6.11.2. SVO vs SOV

- 1) Germans prefer to parse SVO sentences and especially that ungrammatical SVO-sentences in subordinate clauses do not have a processing disadvantage.
- 2) Aphasics do not have as expected a preference for SOV, but rather for SVO.
- 3) We find the finite verb in final position in only 26% of German sentences.
- 4) SOV needs more working memory space.
- 5) Head-Inconsistency in German subordinate clauses since we find an SOV-order with prepositions.

But:

- 1) Verb-final (infinite verb) is acquired earlier than V2 (see chapter ...)
- 2) German second Language Learner transfer German word order in learning an SVO language and transfer also verb-final position. This is surprising because Germans prefer SVO in German and so we might assume that verb-final is not transferred.

Normally, especially if we think that grammatical items are in competition (see for example Yang (2000), Pintzuk) we might suppose that children would lose this SOV-

structure because evidence is too weak if we consider 1) to 4). But this does not happen. SOV in subordinate clause is stable in languages like German or Dutch.

6.11.3. Case Marking and Word order variety

Lupyan and Christiansen (2002) argue that case markings and word order “function as cues for a sequential learning device acquiring syntactic structure” According to the authors, in fixed word-order languages like SVO-languages, word order is the cue for acquiring syntactic relations (who did what to whom), while in languages with multiple word orders case marking is the cue for syntactic relations.

Most OV languages have case markings and several word orders (Greenberg 1963). Case markings might act as an important cue for acquiring several word orders. Case marking as a syntactic cue does not explain why we find in some languages like Russian all possible six word orders and why in other languages only four of them. Additionally, SOV-languages without nominal inflections (Sasse (1977)) indicate that case inflections are not necessary for acquiring an SOV-language.

We might think that the number of cases is responsible, but one also has to consider the possibility that case marking interacts with other syntactic cues. In Dutch NPs are not overtly case marked. But we still have V2 in root clauses and SOV in subordinate clauses. V2 with a lack of case marking can create a certain ambiguity as we can see in the following sentence:

139) De dichter heeft de boer gegroet

This sentence can be parsed as (S before O)

a) The poet greeted the farmer (S before O).

or as O before S

b) The poet, the farmer greeted (OS).

Because of the V2-rule the subject or the object can be parsed in first position. This example is taken from Kaan (1997) who wrote about Subject-Object Ambiguities in Dutch. Since we find V2 and verb-final structures in German and Dutch, case marking cannot be the cue how children acquire a verb-final language with verb movement of the finite verb in second position in root clauses. S-O order is more frequent in Dutch, but this does not necessarily imply that O-S is rarer because of the lack of case-marking in Dutch. In German, where we have a case-marked system S-O is the preferred order in main clauses. Bornkessel et al. (2002) used the 'W-Pub' corpus (Mannheimer Institut für deutsche Sprache) and found that the combination of a finite verb in the second position + *der* ('theNominative Subject') occurs approximately 96 times more often than the combination of a finite verb and a definite non-nominative determiner (objects).

Kiparsky (1996) pointed out that case marking seems to be necessary but not a sufficient condition for word order variety. Icelandic, for example, has at least as a rich case marking system as German, but we find a quite rigid SVO-word order in this language. Lupyán and Christiansen (2002) give the example "Mary loves Peter" in

Russian where case markings avoid ambiguities. But in Dutch and here even in German⁴¹ this example can be ambiguous⁴² since object or subject can be first and the verb stays in second position. But as already mentioned, Germans prefer to parse SVO and in Dutch we find here the same phenomenon. According to Kaan (1997) the parser opts for the most frequent occurring solution, which for Dutch and German is S-O. But since these languages tend nevertheless to preserve these structures another syntactic cue must be responsible (or interact with case markings) for its preservation.

In the following we will present evidence that the infinite verb is a major syntactic cue for the acquisition of the underlying position of I (d-structure). First, we will present a corpus-based approach. The corpus being used is Negra (Skut et al., 1997), which is composed of approximately 20000 hand-tagged sentences of German newspapers.

Second, I present a study with a connectionist model where German finite and infinite verb phrases structures have been integrated based on the frequencies of these phrases of the Negra-corpus. We also take a look at prepositions in these studies 1) and 2), since prepositions with verb-final structures are inconsistent structures and third, I will present evidence from experiments concerning the importance of the infinite verb in the acquisition of the position of I in d-structure and the role of V2-structures.

⁴¹ Names are not case-marked in German.

⁴² In reality intonation might disambiguate this example in German or Dutch and if intonation is 'neutral', one would assume an SVO-order.

Statistical distribution of finite and infinite verbs

In the following, we will see the statistical distribution of finite and infinite verbs in main and subordinate clauses.

Verb positioning in Main Clauses

First, we take a look at inconsistencies that occur because of verb separation, i.e. that the finite verb is in middle position (V2) and the infinite verb in sentence-final position. Here we have an inconsistency, which is expressed through the occurring center-embedding.

Table 6.3 : The distribution of finite and infinite verbs in German main clauses.

Finite verb phrases	Infinite verb phrases	Total number of VPs	Percentage of Infinite verb phrases
Vf NP 7345	Vf NP Vi 5202	12547	41.5%
Vf PP 2072	Vf PP Vi 1812	3884	46.7%
Total 9417	Total 7014	Total 16431	Total 42.7%

As we can see the infinite verb phrases are frequent in German main clauses. We assume that the learner extracts this information for acquiring finite verbs in sentence-final position later on in subordinate clauses. After this account we should not include VP -> Vf and VP -> Vf Vi since the verb is final in both cases, but the learner cannot use this information without the evidence where NPs and PPs occur.

So, the learner has a cue statistically well presented of acquiring subordinate clauses. In the following let us see what happens in subordinate clauses and compare this to the statistically distribution in main clauses.

Verb positioning in subordinate clauses

Concerning the verb positioning in subordinate clauses we do not find inconsistencies. But the verb is always in final position and the occurrence of the infinite verb in sentence-final position might be an important cue why children acquire this.

. **Table 6.4a: Proportion of Clauses**

Main Clause VPs		Subordinate Clause VPs	
Vf NP	44.7 %	NP Vf	38.1 %
Vf PP	12.6%	PP Vf	9.3 %
Vf NP Vi	31.7%	NP Vi Vf	41.1%
Vf PP Vi	11 %	PP Vi Vf	12.5%
Total	100%	Total	100%

In table 6.4a we have respectively the percentages of the structures in main clauses and subordinate clauses. Between the consistent structure NP VI Vf and the inconsistent

structure Vf NP Vi we have a difference of nearly 10 %. The consistent main clause structure Vf PP is slightly higher present than its inconsistent subordinate counterpart PP Vf. We also see a difference in Vf NP and NP Vf, which cannot be explained in terms of consistencies since both structures are consistent, but the subordinate structure is verb-final, while in the main clause structure we do not find any cue for verb-final. In table 6.4b) we will see the distribution of subordinate clauses and main clauses.

Table 6.4b: Proportion of Subordinate clauses

Main Clause VPs		Subordinate clause VPs		Subordinate Clause / total number of clauses (in %)
Vf NP	7345	NP Vf	1838	20 %
Vf PP	2072	PP Vf	447	17.7 %
Vf NP Vi	5202	NP Vi Vf	1983	27.6 %
Vf PP Vi	1812	PP Vi Vf	602	24.9 %
<i>Total</i>	<i>16431</i>	<i>Total</i>	<i>4825</i>	<i>Total 22.7 %</i>

In the Negra-Corpus, we found a total of 12.5% subordinate clauses without infinite verbs and 21.6% subordinate clauses with infinite verbs. In the structures we are interested, the count for subordinate clauses seems to be higher. But still we find more subordinate clauses with infinite verbs than without infinite verbs (table 6.5b).

Table 6.5a: Proportion of Subordinate clauses without infinite verbs in German

Main clauses without infinite verbs		Subordinate clauses without infinite verbs		Subordinate Clause / All Clauses without infinite verbs (in %)
Vf NP	7345	NP Vf	1838	20%
Vf PP	2072	PP Vf	447	17.7 %
Total	9417	Total	2285	Total 19.5 %

In the main clauses (structures consistent) in table 6.5a) the learner does not find any evidence of a verb-final structure.

Table 6.5b: Proportion of Subordinate clauses with infinite verbs in German

Main clauses with infinite verbs	Subordinate clauses with infinite verbs	Subordinate Clauses / All Clauses with infinite verbs (in %)
Vf NP Vi 5202	NP Vi Vf 1983	27.6 %
Vf PP Vi 1812	PP Vi Vf 602	24.9 %
Total 7014	Total 2585	Total 26.9%

When we compare the table 6.5a with table 6.5b, we notice that the proportion of main clauses with infinite verbs is lower than the proportion for main clauses without infinite verbs. But then when we come to subordinate clauses we find more subordinate clauses with infinite verbs in total number and the percentage between subordinate clauses is 36.9% compared to 24.3% for subordinate clauses without infinite verbs. This correlation could mean that learners use the inconsistencies with infinite verbs in final position for acquiring and parsing subordinate clauses. So, the infinite verb is apparently the cue for acquiring subordinate clauses.

6.12 SRN-simulation

In the following, we will illustrate the learning of German verb positioning at the example of an SRN-simulation. The results of this simulation have been presented in Monaghan and Gonitzke (2003).

Inconsistent structures in language are harder to learn than consistent structures by computational systems, whether inconsistencies are at the syntactic level (Christiansen & Devlin, 1997), or at the lexical level, in terms of grapheme to phoneme correspondences (Plaut, et al., 1996), or semantic ambiguities (Cottrell, 1986).

The approach of Monaghan and Gonitzke (2003) to account for learnability of inconsistencies was to bring together syntactic theory with analyses of the frequencies of different structures in real language corpora, and combine these with computational modeling. Previous simulations of word order have largely ignored the proportions of different syntactic structures (though with notable exceptions, e.g., MacDonald & Christiansen, 2002). Through the use of real language corpora in modeling, Monaghan and Gonitzke (2003) hoped to increase the precision of determining the extent to which the processes of sequential learning are engaged in language processing.

This study presents a series of corpus analyses and simulations that explore on German and English basic word order. The sentences are subscripted with subject (S), object (O), finite verb (Vf), infinite verb (Vi), and complementiser (C) to indicate the structures. German has the following structures:

Main clauses:

Subordinate clauses:

SVfO

SOVf

SVfOVi

SOViVf

In English, in contrast, word order is SVO in both main and subordinate clauses:

Main Clauses:

Subordinate clauses:

SVfO

SVfO

SVfViO

SVfViO

Monaghan and Gonitzke (2003) try to model the role of the final infinite verb. We suggest that general sequential learning behaviour, as reflected in simple recurrent networks (see Figure 6.1), contributes towards preserving such structures in German word order.

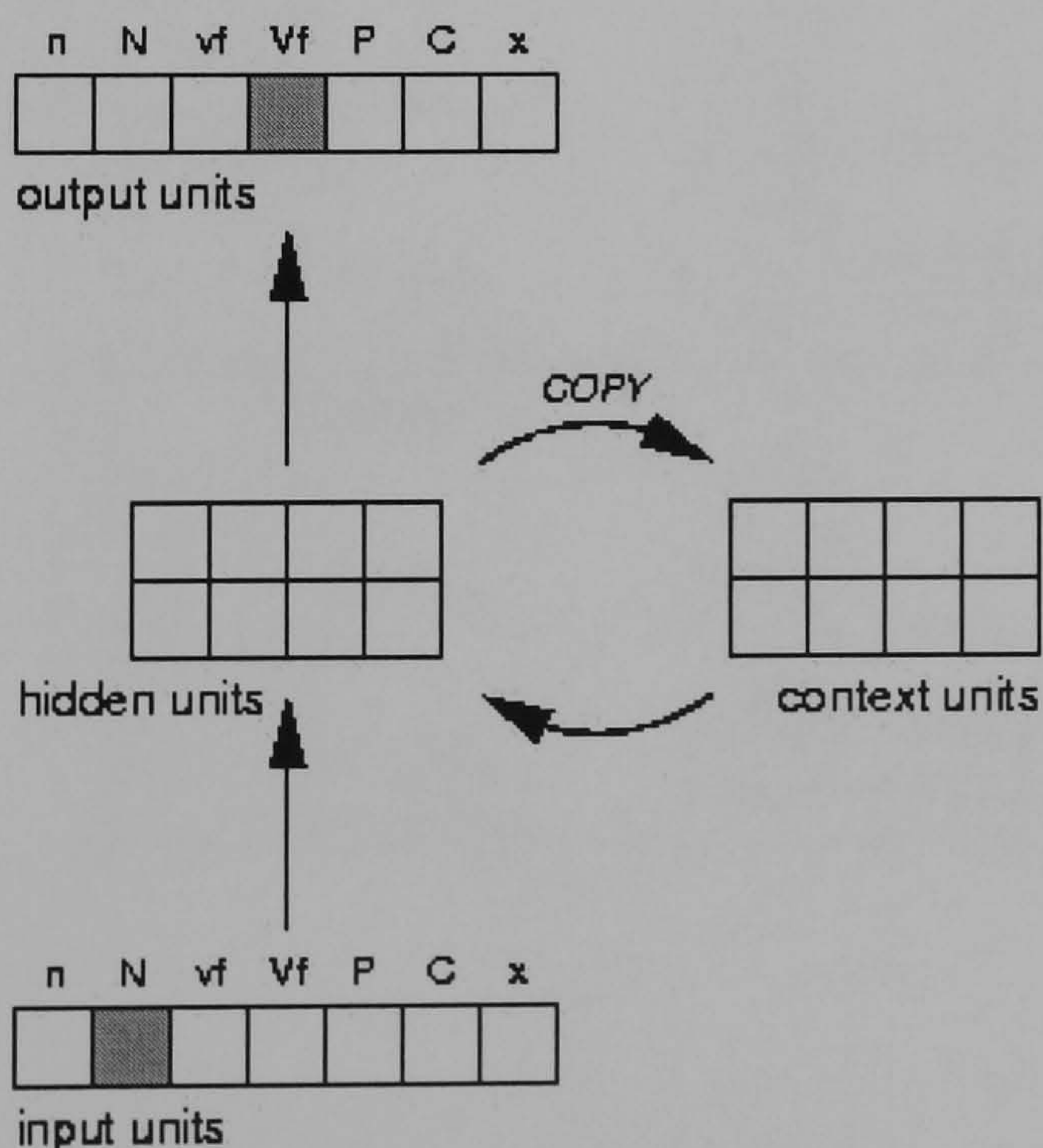


Figure 6.1. The simple recurrent network architecture used in the simulations. The model is trained to predict the next word in the sentence, given the current word and the context of the previous state of the hidden unit.

Monaghan and Gonitzke (2003) explore three grammar fragments of German, compared to the corresponding fragment in English. The authors postulate that, though subordinate structures may be harder to learn in German, the occurrence of verb-final structures in main clause infinite verb phrases results in easier learning of these structures. Finite verbs in final position are rarer than infinite verbs in final position (26% compared to 74%), and the verb-final position of infinite verbs is acquired earlier than the position of the finite verb (Clahsen & Muysken, 1986). This suggests that verb-ordering in German is influenced by the occurrence of both finite and infinite verb phrases.

6.12.1. Main and subordinate clauses without infinite verbs

Table 6.6. Grammar 1 for English and German with main and subordinate clauses, with proportions of each structure derived from BNC and NEGRA corpora.

ENGLISH	PROPORTION
S → S S-bar	7.7%
S → NP V _f P	92.3%
S-bar → C NP V _f P _{sub}	100%
NP → N (PP)	76.2% (23.8%)
PP → P NP	100%
V _f P → V _f (NP) (PP)	34.3% (48.5%) (17.2%)
V _f P _{sub} → V _f (NP) (PP)	32.5% (46.5%) (21.0%)
GERMAN	
S → S S-bar	12.5%
S → NP V _f P	87.5%
S-bar → C NP V _f P _{sub}	100%
NP → N (PP)	65.6% (34.4%)
PP → P NP	100%
V _f P → V _f (NP) (PP)	10.2% (70.0%) (19.8%)
V _f P _{sub} → (NP) (PP) V _f	(78.3%) (19.1%) 2.6%

The first grammar that Monaghan and Gonitzke (2003) compare between English and German consisted only of finite verb phrases. The purpose of this simulation was to test whether the grammar with SVO in main clause and SOV in subordinate clause was harder to learn than the grammar with SVO in both main and subordinate clauses.

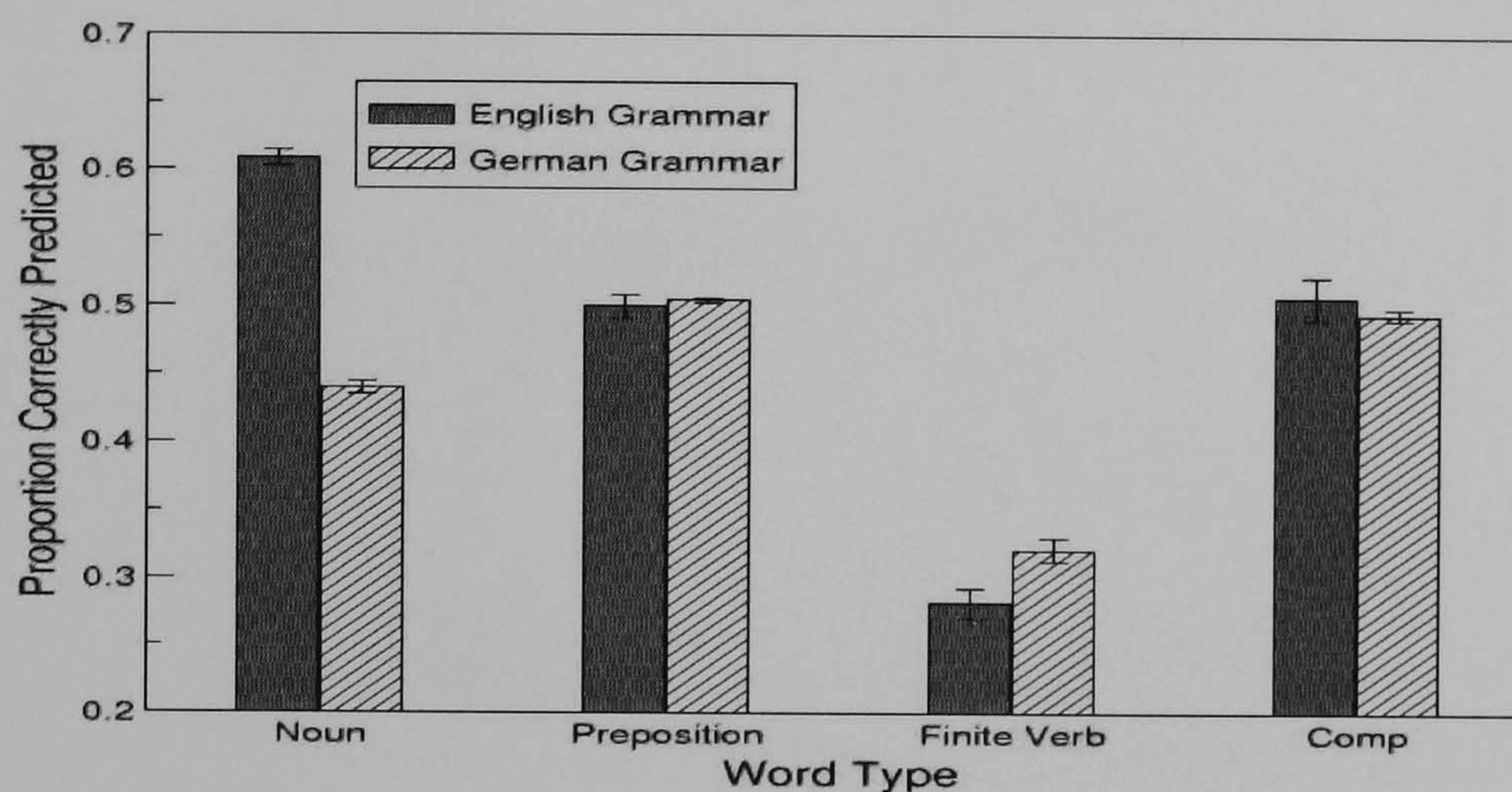


Figure 6.2. Proportion of words in each category correctly predicted by the model for Grammar 1 (see text for details).

Elements in parentheses indicate that these are optional, so a NP can be composed of a noun (N), or a N and a prepositional phrase (PP).

A corpus of 1000 sentences was generated, with branching according to the proportions of each structure that we found in the corpora for each grammar. 10 simulations were run for each grammar, with different randomly generated corpora of 1000 sentences. We can see that SOV in subordinate clauses is a problem because the sequence following a noun is easier to learn for English than for German.

The rare occurrence of the SOV structure in German would put pressure on the survival of the inconsistency, and so the authors looked to a fuller grammar to see whether other structures may contribute towards the preservation of the subordinate clause word order. First the author looked at differences in word order for finite and infinite verb phrases.

6.12.2. Finite and infinite verbs in main clauses

Table 6.7. Grammar 2 for English and German with main clause finite/infinite verb phrases, with proportion of each structure from BNC and NEGRA corpora.

ENGLISH	PROPORTION
$S \rightarrow NP V_f P$	35.7%
$S \rightarrow NP V_i P$	64.3%
$NP \rightarrow N (PP)$	60.0% (40.0%)
$PP \rightarrow P NP$	
$V_f P \rightarrow V_f (NP) (PP)$	34.3% (48.5%) (17.2%)
$V_i P \rightarrow V_f V_i (NP) (PP)$	35.6% (40.0%) (24.5%)
GERMAN	
$S \rightarrow NP V_f P$	50.2%
$S \rightarrow NP V_i P$	49.8%
$NP \rightarrow N (PP)$	64.5% (35.5%)
$PP \rightarrow P NP$	
$V_f P \rightarrow V_f (NP) (PP)$	10.2% (70.0%) (19.8%)
$V_i P \rightarrow V_f (NP) (PP) V_I$	9.9% (66.8%) (23.3%)

The grammar fragments that were employed to assess the learnability of sentences containing finite and infinite verb phrases are shown in Table 6.7.

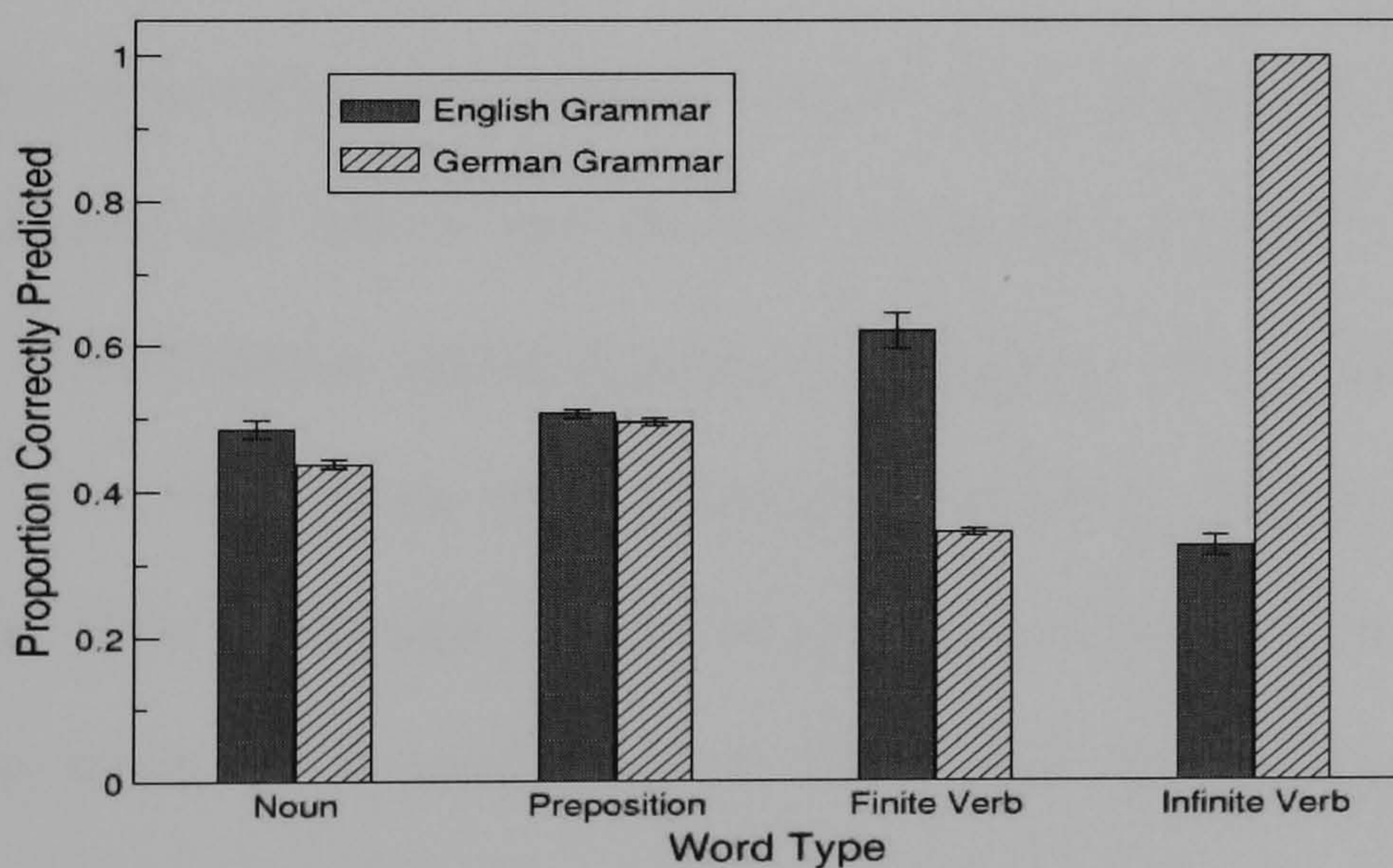


Figure 6.3. The model's performance on the English and German versions of Grammar 2 with finite and infinite verb phrases in main clauses.

In English, the infinite verb interposes between the finite verb and the object noun. In German, the infinite verb is positioned at the end of the sentence. Consequently, in German, the object noun is generally preceded by the finite verb. The second simulations test the hypothesis that this results in greater difficulty in learning the sequential order of the English grammar.

The model trained on the German grammar learned the conditional probabilities with greater accuracy. The interposition of the infinite verb after the finite verb resulted in greater difficulty in learning for the English grammar. The verb-final structure of the German grammar, in contrast, was learned with relative ease. Figure 6.3 indicates that this was due to the 100% predictability of the end-of-sentence occurring after the infinite verb in German. In English, the infinite verb can precede a noun, a preposition or an end-of-sentence marker. The difference for infinite verbs was highly significant. However, the difference for finite verbs was also significantly different, with English being more predictable than German. This was due to the high frequency of the infinite verb following the finite verb in English, whereas in German the finite verb can precede a noun, a preposition, or an infinite verb. No other comparisons were significant. Finite verb phrases and infinite verb phrases are learned earlier in main clauses than word order in subordinate clauses (Clahsen & Muysken, 1986). However, children do not make word-order errors in constructing subordinate clauses in German (Meisel & Müller, 1992; Rothweiler, 1993). Does this verb-final construction in infinite verb phrases assist the acquisition of the word-order inconsistencies in the subordinate clauses in German? The next simulation tests this question.

6.12.3 Finite and infinite verbs in main and subordinate clauses

Table 6.8: Grammar 3 for English and German with finite and infinite verb phrases in main and subordinate clauses, showing the proportions of each structure.

ENGLISH	PROPORTIONS
S → S S-bar	18.6%
S → NP V _f P	35.7%
S → NP V _i P	64.3%
S-bar → C NP V _f P _{sub}	25.2%
S-bar → C NP V _i P _{sub}	74.8%
NP → N (PP)	75.7% (25.2%)
PP → P NP	100%
V _f P → V _f (NP) (PP)	34.3% (48.5%) (17.2%)
V _i P → V _f V _i (NP) (PP)	35.6% (40.0%) (24.5%)
V _f P _{sub} → V _f (NP) (PP)	59.9% (28.9%) (11.2%)
V _i P _{sub} → V _f V _i (NP) (PP)	43.1% (45.5%) (27.5%)
GERMAN	
S → S S-bar	21.6%
S → NP V _f P	50.2%
S → NP V _i P	49.8%
S-bar → C NP V _f P _{sub}	46.7%
S-bar → C NP V _i P _{sub}	53.3%
NP → N (PP)	59.1% (40.9%)
PP → P NP	100%
V _f P → V _f (NP) (PP)	10.2% (70.0%) (19.8%)
V _i P → V _f (NP) (PP) V _i	9.9% (66.8%) (23.3%)
V _f P _{sub} → (NP) (PP) V _f	2.6% (78.3%) (19.1%)
V _i P _{sub} → (NP) (PP) V _i V _f	1.2% (75.8%) (23.0%)

The authors constructed the grammar fragment of English and German that included both finite and infinite verbs in main and subordinate clauses. The grammar is shown in Table 6.8. The model was adapted from the previous simulation by adding a unit at the input and output layers for the complementiser. Once again, 10 simulations of each grammar were trained on training sets of 1000 sentences that were randomly

generated according to the general proportions of structures found in the language corpora.

Figure 6.4. Proportion of correct predictions for each word category for Grammar 3 with finite and infinite verb phrases in main and subordinate clauses.

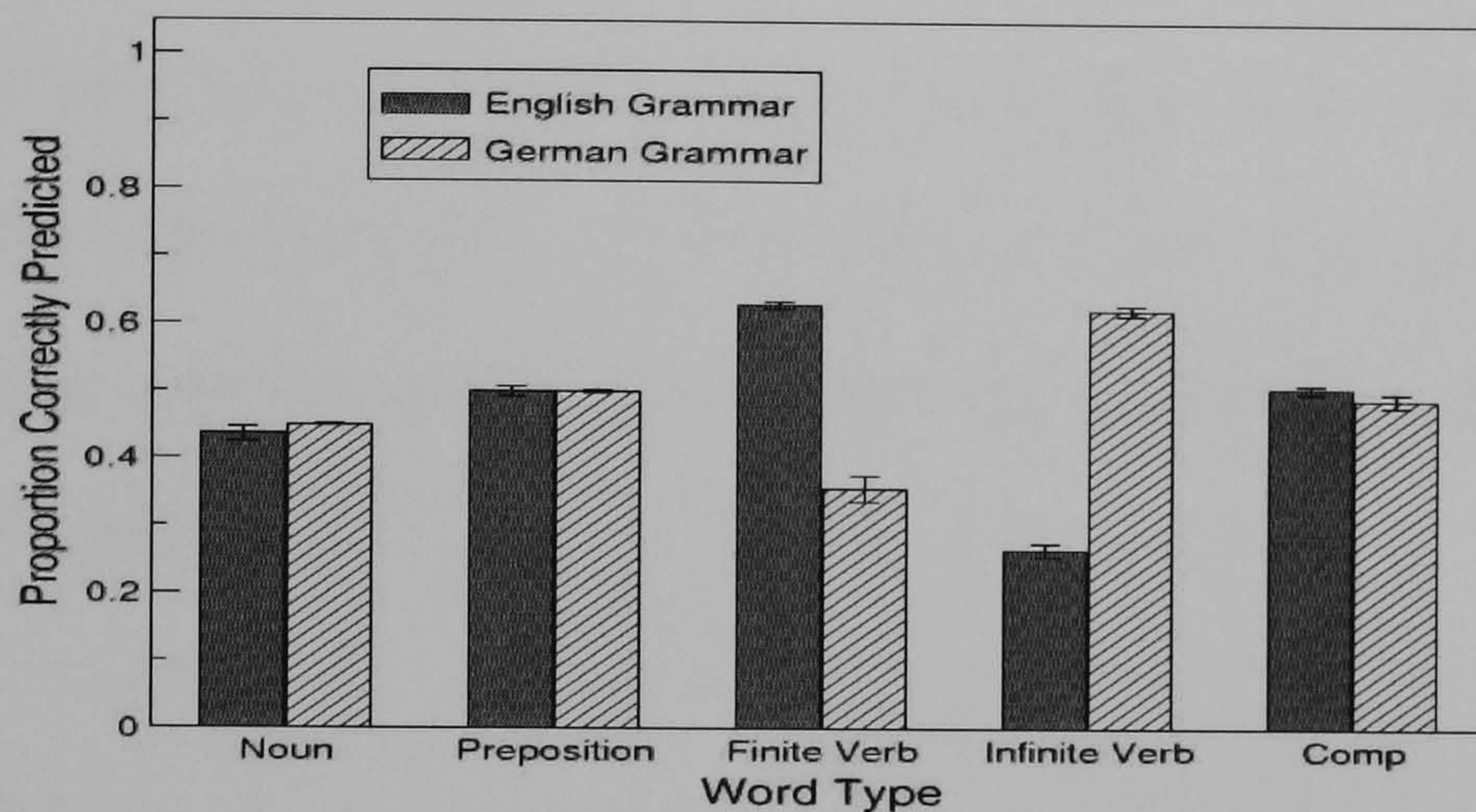


Figure 6.4 shows the performance of the model on predicting the word category following each word type. Though the model's performance did not differ overall between the English and the German grammar, there were differences for the different verb types. For infinite verbs, German was easier than English. For finite verbs, English was easier than German. The lower predictability of words following finite verbs in German is consistent with the claim that case-marking is especially useful for languages with greater variation in word order (Lupyan & Christiansen, 2002). No other comparisons were significant.

Of particular note is the absence of an effect of prediction after the noun. For Grammar 1, the sequence following a noun is easier to learn for English than German, but for Grammar 3 there is no significant difference between English and German. In

the paper the authors said that “we interpret this as the different word order in subordinate clauses in German being rendered more easily learnable when infinite verb structures are also included in the grammar. This makes sense if one interprets the language learner acquiring one of a competing set of grammars. The infinite verb-final structure appears to affect performance on learning the word order of subordinate clauses”. But this interpretation could be problematic. The network does actually take finite and infinite verbs as two categories. It does not consider that finite and infinite verbs have the stem, and only differ by their morphology. The network does not take into account that infinite verbs are easier to learn and finite verbs are harder to learn because of richer verb morphology. So, the network simulation is restricted and can only give us a vague idea.

6.12.4. Conclusion

The models indicate that, for the learning of sequential order of nouns and verbs, SVO and SOV word order inconsistencies are alleviated by overlapping patterns of word ordering in other structures in the grammar. The verb-final structure in German infinite verb phrases results in less difference between predictions of the lexical category following a noun for English and German. We contend that the survival of the different word order in subordinate clauses in German is due, in part at least, to these verb-final constructions. The verb-final construction in subordinate clauses is rendered more easily learnable as this pattern of word order is more common in Grammar 3 than in Grammar 1. More generally, this indicates that the implications for inconsistencies in structures in languages are not sufficient alone to determine whether the language will survive: the interplay between different structures must be considered.

Chapter 7

7.1 Introduction

Here in the following, we will see some experiments on the learning of verb order in German. There is a very well established literature on artificial grammar learning. The originator of that field is Arthur Reber (1965). In artificial grammar learning, the input consists of meaningless visually presented letter strings such as XSAADS (Dienes, 1991; Redington, 1996). The literature on language learning is also well developed. Saffran et al (1996a,b, 1999) showed that infant and adult learners are sensitive to the distribution of statistical cues using auditory input of meaningless material. Saffran suggest that adults possess learning mechanisms which detect and utilize statistical cues to phrase and hierarchical structure using audio material of non-words such as BIFF, RUD and MIB, strings and shapes. Morgan and Newport (1981) did also experiments on constituent order using non-words, in which dependencies between word categories afforded predicative cues to phrases, as in natural languages. For example, if D is present, A must be present.

In this experiment, we decided to use real words because in this experiment it was essential that people do not have to learn the basic categories such as noun and verbs and have direct access to these categories. It was essential that people can match infinite verbs and make connections with other verbs and can see the connection between

infinite and finite verbs. Our participants were adults, undergraduates as in the case for Saffran.

German has the finite verb in medial position in main clauses, while infinite verbs appear in an OV-position. In subordinate clause finite verbs appear in sentence-final position. Our hypothesis as discussed before is that the infinite verb helps people acquiring the right verb-position in subordinate clauses. We did an experiment in English, where we examined if infinite verbs help acquiring the verb-positioning in subordinate clauses. The experiment showed that this is the case. Then we did a very similar experiment in French, because the morphological distinction between finite and infinite verbs is bigger, and we found that this information additionally helped.

The experiment in English was done with English words, while the French experiment was done with French words. The structures, on the other hand, either come from other languages or do not seem to exist in other natural languages as it will be explained in the following.

It could be argued that such experiments are highly artificial, considering that language acquisition takes a much longer time than possible learning in an experiment. Still, in a very limited way, we could show that the position of the infinite verb had an influence on the learning of the finite verb.

7.2. Infinite Verb Experiment with English speakers

The experiment consists of 3 conditions. Each condition consists of 56 stimuli that are presented in a random order. They are presented on a screen for a duration of 5 seconds for each sentence. The sentences consist of the same lexical elements in both conditions and only the position of verbal elements differ in-between the conditions according to

the grammar of the condition. In each condition, there are 50 main clause stimuli and 6 subordinate clause stimuli. 15 of the 50 main clause stimuli present a kind of V2-second grammar that means that a non-subject can be fronted in sentence-initial position. In condition 1, the infinite verb occurs in basic OVi-position and the finite verb occurs in medial position in main clauses such as 'S Vf O Vi and in sentence-final position in subordinate clauses such as 'S O Vi Vf. In condition 2, the infinite verb occurs in verb-medial position, which is ViO and the infinite occurs in medial position in main clauses such as S Vf Vi O, and in sentence-final position in subordinate clauses such as 'S Vi O Vf. In condition 3, the infinite verb occurs in final position OVi as in condition 1, but the finite verb stays always in verb-medial position. After the presentation of these stimuli, the participants have to judge 10 sentences. They are the same for all conditions, so that results can be easily compared.

The participants were told explicitly, that they learn a new language. They were told that although the words are in English, the structure of the language is independent of English. The participants were awarded 3 pounds and recruited by a website of the Psychology Department accessible to Warwick University students. The students were allocated randomly to any condition

7.2.1. Stimuli in Condition 1

35 main clause stimuli with an initial subject having a final infinite verb with the following forms (Od- direct object, Oi – indirect object, PP – prepositional phrase):

- 22 S Vf Od Vi

- 8 S Vf PP Vi

- 4 S Vf Oi Od Vi
- 1 S Vf Od PP Vi

In these 35 sentences, the subject comes first and it is followed by the finite verb. The 15 remaining main clause sentences exhibit a verb second phenomenon, which means that a non-subject is fronted and then followed immediately by a finite verb, which respectively is followed by the subject (inversion):

- 7 Od Vf S Adv Vi
- 1 Od Vf S Oi Vi
- 3 Oi Vf S Od Vi
- 4 PP Vf S Adv Vi

There are 6 subordinate clauses, which have verb-final structures:

3 subordinate clauses of the form SOVf

3 subordinate clauses of the form SOViVf

So, only 10% of the presented stimuli are subordinate clauses with a finite verb in final position. Our position is that the final infinite verb in main clauses helps acquiring verb-final structures in subordinate clauses.

This implies that the cue for acquiring final finite verb positions is not present when the infinite verb is in medial position as we encounter it in condition 2.

7.2.2. Stimuli in Condition 2

35 main clause stimuli with an initial subject having a final infinite verb with the following forms:

- 22 S Vf Vi Od
- 8 S Vf Vi PP
- 4 S Vf Vi Oi Od
- 1 S Vf Vi Od PP

In these 35 sentences, the subject comes first and it is followed by the finite verb. The 15 remaining main clause sentences exhibit a verb-second-phenomenon, which means that a non-subject is fronted and then followed immediately by a finite verb, which respectively is followed by the subject:

- 7 Od Vf S Vi Adv
- 1 Od Vf S Vi Oi
- 3 Oi Vf S Vi Od
- PP Vf S Adv Vi

There are 6 subordinate structures, with final finite verbs, while the infinite verb stays in verb-medial structure:

3 subordinate clauses of the form SOVf

3 subordinate clauses of the form SViOVf

For each words three to four words were used, which were all part of basic general vocabulary. For example verbs were: go, eat, come, live and auxiliary verbs.

7.2.3. Stimuli in Condition 3

In condition 3, we have the same main clause stimuli as in condition 1, the subordinate clause stimuli are different in the sense, that the finite verb here appears in medial position, thus we get the following subordinate clause stimuli for condition 3:

3 subordinate clauses of the form SVfO

3 subordinate clauses of the form SVfOVi

7.2.4. Judgment task

After the presentation of the stimuli, participants were confronted with a judgment task, where they had to decide if 10 sentences fit with the presented stimuli. On both conditions we tested participants on the same sentences, so that a comparison between the sentences in each condition is possible.

The sentences of the judgement task are the following:

- 1) They say that she his friend left
- 2) I will my homework finish
- 3) He has repaired the bike
- 4) I think that he the bus missed had
- 5) They say that they have seen the movie
- 6) You have your friend helped
- 7) He answers the question
- 8) He thinks that they forgotten the address have
- 9) I think that you have the ball kicked
- 10) I think that the man tall is.

Sentence 1 and 10 is correct according to the grammar in condition 1 and 2 since the finite verb goes to final position in subordinate clauses, but incorrect in condition 3 since the finite verb appears there in sentence-medial position. Sentence 2 is correct in condition 1 and condition 3 but incorrect in condition 2. Sentence 3 is correct in condition 2 but incorrect in condition 1 and condition 3, where the infinite verb has to occur in sentence-final position. Sentence 4 is correct in condition 1, but incorrect in condition 2, where the infinite verb always precedes the object and incorrect in condition 3 since here the finite verb is in medial position. Sentence 5 is incorrect in all three conditions because in both condition 1 and 2 the finite verb occurs in sentence-final position in subordinate clauses, and in condition 1 and 3 the infinite verb occurs in final position. Sentence 6 is correct in condition 1 and condition 3, but incorrect in condition 2, where the infinite verb precedes the object. Sentence 7 is correct in all conditions since the finite occurs in second position in main clauses in all conditions. Sentence 8 is correct in condition 2, where the the infinite verb occurs before the object,

but incorrect in condition 1 and condition 3 where the infinite verb is to occur after the object. Sentence 9 is incorrect in condition 1 and 2 since the finite verb is not in final position in the subordinate clause, but correct in condition 3.

Table: Test sentences

Sentences	Condition 1	Condition 2	Condition 3
1) <i>They say that she his friend left</i>	C	C	I
2) <i>I will my homework finish</i>	C	I	C
3) <i>He has repaired the bike</i>	I	C	I
4) <i>I think that he the bus missed had</i>	C	I	I
5) <i>They say that they have seen the movie</i>	I	I	I
6) <i>You have your friend helped</i>	C	I	C
7) <i>He answers the question</i>	C	C	C
8) <i>He thinks that they forgotten the address have</i>	I	C	I
9) <i>I think that you have the ball kicked</i>	I	I	C
10) <i>I think that the man tall is</i>	C	C	I

Table 7.1

7.2.5. Results

In the following, we will see that the infinite verb might influence the acquisition of verb-final order in subordinate clauses. We only compare responses, which mean that it is independent of which it is correct in condition 1 or 2. Either the participant judges the

sentence as correct, so it is '1' or as incorrect, and in this case it is '0'. Here, we start with an SVfOVi-structures.

Infinite Verb in final position (SVfOVi)

	Condition 1	Condition 2
Sentence 2	21	10
Sentence 6	22	13

Table 7.2

We see that naturally in condition 1 where this structure fits with the grammar the positive responses are higher. Sentence 2 reaches significance with $p < 0.05$, sentence 6 is close of being significant in the Mann-Whitney test.

Infinite Verb in medial position (SVfViO)

	Condition 1	Condition 2
Sentence 3	3	18

Table 7.3

Sentence 3 also reaches significance on the Mann-Whitney test. We can see that in condition 1, a majority of participants refuse the VO-structure, while in condition 2 participants accept the VO-structure.

Now, we come to the subordinate-clauses. The hypothesis is that when the infinite verb is final, it is easier to learn subordinate structures where the finite verb is final. In

condition 1, the infinite verb is final, so we would expect more participants to judge subordinate clauses with final finite verbs as correct as in condition 2, where the infinite verb precedes the object.

Subordinate Clause SOVf

	Condition 1	Condition 2
Sentence 1	21	10
Sentence 10	15	11

Table 7.4

In condition 1, participants performed significantly better on the subordinate SOVf, when the finite verb is a lexical verb (sentence 1). Out of 25 participants 21 judged this sentence as correct. In comparison with condition 2, this result reaches significance in the Mann-Whitney test with $p < 0.05$. When the verb is an auxiliary verb (sentence 10), then participants performed significantly worse in condition 1, only 15 out of 25 participants then judged the SOVf-structure as correct. In condition 2, sentence 10 was judged as 'correct' by 11 out of 25 participants. Sentence 1 was judged by 10 participants as correct in condition 2. Obviously, this difference is not significant.

Here we have a more complex subordinate structure, where both the finite and the infinite verbs are final. As before, we would expect that people who have seen the infinite verb final in condition 1 will learn this structure better.

Subordinate Clause SOViVf

	Condition 1	Condition 2
Sentence 4	12	14

Table 7.5

S4 is a correct subordinate clause in condition 1. 12 participants thought that this sentence is correct in condition 1 and 14 thought that this structure is correct in condition 2. This structure is also more difficult for children to acquire because it is a complex subordinate structure. According to Mills (1985), the child applies the correct order of the subordinate clause as long as the verb is non-complex, as our participants in the experiment did. Complex predicates, structures such as [[past participle] auxiliary] or [[infinitive] modal], turn out to be difficult to learn. Children either replace the complex structure by a simple verb or reverse their order. For our participants in condition 1, this structure was more difficult to acquire.

In sentence 5, we have another complex subordinate structure with both the finite and the infinite verb preceding the object.

Subordinate Clause SVfViO

	Condition 1	Condition 2
Sentence 5	3	14

Table 7.6

Sentence 5 also reaches significance on the Mann-Whitney test. We can see that in condition 1, a majority of participants refuse the VO-structure, while in condition 2 more participants accept the VO-structure.

In sentence 7, we have a main clause SVO-structure.

Main Clause SVfO

	Condition 1	Condition 2
Sentence 7	5	21

Table 7.7

Sentence 7 is an SVO-structure with only a finite verb and would be correct in both conditions. In the Mann-Whitney Test, sentence 7 is significant. In the first condition, 20 participants out of 25 assumed that this structure is incorrect, while in condition 2, 21 participants assumed that this structure is correct.

In sentence 8, we have a subordinate structure, where the infinite verb precedes the object, and the finite verb follows the object.

Subordinate Clause SViOVf

	Condition 1	Condition 2
Sentence 8	11	9

Table 7.8

Since complex structures are more difficult to acquire, it becomes clear, that participants cannot acquire a structure like in sentence 8. It is correct in condition 2, since the infinite verb always stays in medial position. First, it is difficult to acquire because of the finite verb in final position, where no syntactic cue was present for its acquisition as it is the case in condition 1 with the final infinite verb in main clauses. Second, it is a complex structure that is separated by a object, so a discontinuous structure.

A structure as in sentence 8, does not occur in any natural languages (Steele (1975), Dryer (1992)). In Old English, the infinite verb could occur in both positions, OVi (final position) and ViO (medial position). The finite verb could be medial and final when the infinite verb was final, but the finite verb could never be in final position when the infinite verb was in medial position (Pintzuk (1999)).

Subordinate Clause SVfOVi

	Condition 1	Condition 2
Sentence 9	18	11

Table 7.9

A subordinate structure as in sentence 9 has not been seen in the input and the comparison of condition 1 and 2 does not turn out to be significant in the Mann-Whitney-test. The finite auxiliary verb is in medial position, but the infinite verb appears in sentence-final position as we find it in main clauses. Thus it is not surprising that 18 participants judged this sentence as correct in condition 1 due to the high frequency the participants encountered this structure in the stimuli. But the structure did

not reach significance since 11 participants judged this sentence as being correct in condition 2.

Condition 3

In condition 3, the infinite verb follows the object, while the finite verb precedes the object in subordinate clauses. We can see although people have not seen the finite verb in final position, people assume such a position as it is in condition 1. In condition 2, the finite verb was final in subordinate clauses, but the infinite preceded the object.

Condition 3 in comparison with Condition 1 and Condition 2

	Condition 1	Condition 2	Condition 3
Sentence 1 Sub.Cl. SOVf	21	10	19
Sentence 2 SvfOVi	21	10	22
Sentence 3 SvfViO	3	18	7
Sentence 4 Sub.Cl.-SOViVf	12	14	9
Sentence 5 Sub.Cl. -SVfViO	3	14	7
Sentence 6 SvfOVi	22	13	22
Sentence 7 SvfO	5	21	20
Sentence 8 Sub. Cl.-SViOVf	11	9	14
Sentence 9 Sub.Cl.-SVfOVi	18	11	20
Sentence 10 Sub.Cl. SOVf	15	11	11

Table 7.10

Sentence 1, which is an SOVf-sentence was judged by 19 participants out of 25 as correct. In sentence 1, the finite verb is a lexical verb. As we have seen it for condition 1, when we have an auxiliary verb instead, participants judge it much less acceptable. Here it is the same case. Only 11 out of 25 participants judge this sentence as correct. Here we also see that the lexical verb in final position in main clauses could be transferred to subordinate clauses. Although sentence 1 was not present in the stimuli, since here the finite verb appears in medial position in subordinate clauses, but the infinite verb still being in final position, participants tend in a majority to think that sentence 1 is acceptable. If we compare it with sentence 10, we see that this decision is based on the fact whether the verb is lexical or not.

We can also see this on sentence 9, where 20 out of 25 participants judged it as 'correct'. Here the infinite verb, which is lexical, is in final position, while the finite verb is in medial position. The same for S2 and S6, which are main clauses, with the infinite verb in final position and the finite auxiliary verb in medial position. Both sentences were judged by 22 out of 25 participants as 'correct'.

If we look at the sentences of the SVO-type, we see that people judge these sentences as 'incorrect'. S3, which has the structure SVfViO, was judged as 'incorrect' by 18 out of 25 participants. S5, is a subordinate clause, where we have the same structure, and equally was judged incorrect by 18 out of 25 participants. Since S9, where we have a subordinate structure with the infinite verb at the end was judged as more acceptable, we can conclude that participants judged S3 and S5 as 'incorrect' because of the infinite verb, which is lexical, appears in medial position. The same for S7, where we have a finite lexical verb in medial position, and are then judged by 20 out of 25 participants as 'incorrect'. Because of the frequent occurrence of an infinite lexical verb in main

clauses in final position, people assume that lexical verbs cannot appear in a VO-position.

Sentence 4 was judged by 16 out of 25 participants as ‘incorrect’. Although this structure is an OV-structure, the infinite verb is followed by a finite verb, and since this was not in the stimuli, participants tend to judge it as ‘incorrect’.

Sentence 8 was judged as ‘correct’ by 14 participants. Since this sentence would be incorrect according to the stimuli, we can say here to that people judge this sentence hasardly.

Comparison of Condition 3 with Condition 1 and Condition 2

If we compare Condition 3 with Condition 1, we will see that both conditions are similar in the sense because participants assumed a verb-final language because of the final infinite verb (see table 7.3) and thus we do not find significant differences (Mann-Whitney).

Table: Mann-Whitney Significance between Condition 1 and 3

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Sign. 2-tailed	.484	.687	.162	.149	.162	.687	1	1	.512	.777

Table 7.11

Then, when we compare Condition 2 with Condition 3, we see here a difference since learners assume a verb-medial condition in Condition 2.

Table: Mann-Whitney significance between Condition 2 and 3

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Sign. 2-tailed	.022	.000	.002	.375	.047	.006	.000	.568	.009	.401

Table 7.12

As we discussed before S4 is not significant because the subordinate structure is complex and the finite verb is an auxiliary verb. S10 is not significant because the finite verb is an auxiliary verb, and S8 is a structure that does not occur in any languages.

7.2.6. Conclusion

We have seen that the infinite verb in final position in main clauses is helpful for acquiring less frequent subordinate clauses. In Condition 1, the infinite verb, which is lexical, is in sentence-final position, while the finite verb is in medial position in main clauses and in final position in subordinate clauses. In condition 2, the infinite verb was in medial position, but the finite verb was still in final position in subordinate clauses. We have seen that in condition 1, participants learned that the finite verb is in final position when the finite verb was lexical. We did not get the effect with an auxiliary verb. In condition 2, where the infinite verb was not in an OVi-position, this structure was not learned. In condition 3, the infinite verb was final (OVi), but the finite verb

appeared in medial position in subordinate clauses. But even then, participants generally assumed that SOVf is correct. The effect was much weaker when the finite verb is an auxiliary verb. Basically, when the infinite verb is final (OVi), participants tend to assume a verb-final language, and when the infinite verb is medial, participants tend to assume a verb-medial language. The infinite verb seems to play a key role in the ‘parameter setting’.

7.3. Infinite Verb Experiment with French Speakers

I replicated the experiment with English-speakers reported above, with French speakers. The experiment was constructed with French words. We have seen that in the experiment with English speakers, we found a different behaviour for lexical and auxiliary verbs. If we replicate this experiment in French, we have a greater distinction between finite and infinite verbs than in the English version. If this information helps, we should get a general stronger effect and the positioning of auxiliary verbs should be also facilitated.

We have three conditions as in the English experiment. The design is exactly the same, and thus we do not mention it here again. The participants were French native speakers with no knowledge of German or Dutch. They were paid 3 euros for the participation.

7.3.1. Results

Comparison of Condition 1 with Condition 2

Infinite Verb in final position (SVfOVi)

	Condition 1	Condition 2
Sentence 2	25	9
Sentence 6	24	7

Table 7.13

In sentence 2 and 6, we have an SVfOVi-structure in condition 1. All participants judged sentence 2 as ‘correct’ in condition 1, and 24 out of 25 participants judged sentence 6 as ‘correct’. In condition 2, where the infinite verb is according to the stimuli in a ViO-order, sentence 2 was judged by 16 out of 25 participants as ‘incorrect’ and sentence 6 was judged by 18 out of 25 participants as incorrect.

Infinite Verb in medial position (SVfViO)

	Condition 1	Condition 2
Sentence 3	3	18

Table 7.14

Sentence 3, where the infinite verb is in medial position, thus SVfViO, was judged by all participants in condition 1, and in condition 2, only 3 persons thought this structure was ‘incorrect’. So, we have seen that like in the English version of this experiment,

verb-final structures in subordinate clauses are acquired more easily when the infinite is in final position.

Subordinate Clause SOVf

	Condition 1	Condition 2
Sentence 1	23	16
Sentence 10	22	18

Table 7.15

In condition 1, SOVf-sentences are judged as acceptable in this French version of the experiment regardless if the verb is lexical or not. Sentence 1, where the finite verb is a main verb was judged as correct by 23 participants out of 25 and in sentence 10, where the finite verb was an auxiliary verb 22 participants judged it as ‘correct’ out of 25. Remember that in condition 1, the infinite verb is in OVi-position and the finite verb is in final position in subordinate clauses. In condition 2, the infinite verb is in ViO-position, but the finite verb is still final in subordinate clauses. We expect that the performance of learning the SOVf-structure is lower in condition 2. Indeed, in condition 2, 9 participants judged sentence 1 as ‘incorrect’, while in condition 1, only 2 participants judged this sentence as ‘incorrect’. Sentence 10 was judged as ‘incorrect’ by 7 participants in condition 2, while only 3 participants judged it as ‘incorrect’ in condition 1. In condition 2, here again we do not have a big difference between lexical and auxiliary verbs in subordinate clauses.

Subordinate Clause SOViVf

	Condition 1	Condition 2
Sentence 4	13	10

Table 7.16

Sentence 4, which has an SOViVf-structure, which is, according to the stimuli, correct in condition 1 was judged as ‘incorrect’ by 12 participants. In condition 2, this structure is according to the stimuli incorrect and 15 out of 25 participants judged it as ‘incorrect’.

Subordinate Clause SVfViO

	Condition 1	Condition 2
Sentence 5	0	14

Table 7.17

Sentence 5, which has an SVfOVi-subordinate structure, was judged as ‘incorrect’ by all participants in condition 1, and was only judged as ‘incorrect’ by 11 out of 25 participants in condition 2.

Main Clause SVfO

	Condition 1	Condition 2
Sentence 7	4	19

Table 7.18

Like in the English version, participants in condition 1 assume a verb-final language, while participants in condition 2 assume a verb-medial language. Sentence 7, which has the structure SVfO, was judged as ‘incorrect’ by 21 out of 25 participants in condition 1, while in condition 2, only 6 participants judged it as ‘incorrect’.

Subordinate Clause SViOVf

	Condition 1	Condition 2
Sentence 8	7	9

Table 7.19

As for sentence 8, which does not seem to exist in any natural languages, 18 participants judged this sentence as ‘incorrect’ in condition 1 and 16 judged it as ‘incorrect’ in condition 2. If we look at the table, we will see that for sentence 8, the difference between condition 1 and condition 2 is the lowest.

Subordinate Clause SVfOVi

	Condition 1	Condition 2
Sentence 9	20	14

Table 7.20

Subordinate structures with complex structures are less biased. Sentence 9 is an SVfOVi-subordinate structure. This structure was judged as ‘correct’ by 20 out of 25 participants in condition 1. Remember that this structure is correct in the case of main clauses and thus participants assumed that this structure was also correct.

Table: Significance between Condition 1 and 2 in French Condition

	1	2	3	4	5	6	7	8	9	10
Sig.	.068	.000	.000	.399	.000	.000	.000	.548	.072	.162

Table 7.21

Condition 3

Sentences	Condition 3
Sentence 1 – MC+SOVf	8
Sentence 2- SVfOVi	19
Sentence 3- SVfViO	7
Sentence 4-MC+SOViVf	5
Sentence 5- MC+SVfViO	6
Sentence 6-SVfOVi	19
Sentence 7-SVfO	5
Sentence 8-MC+SViOVf	6
Sentence 9-MC+SVfOVi	18
Sentence 10-MC+SOVf	7

Table 7.22

In condition 3, as we have seen before, the infinite verb is as in condition 1 in final position, but the finite verb in subordinate clauses stays in final position. Similar, as in the English version, we would expect that some learners would assume verb-final subordinate clauses. 8 out of 22 participants assumed SOVf as correct in sentence 1,

where the finite verb is a lexical verb, and 7 out of 22 participants assumed that sentence 10, where the finite verb is an auxiliary verb as 'correct'. The infinite verb in final position in main clauses was as in condition 1 highly accepted. 19 participants judged SVfOVi as 'correct' in sentence 2 and 6. Sentence 9, where we have a subordinate clause with the structure SVfOVi was also accepted as 'correct' by 18 out of 22 participants.

7.3.2. Comparison between the French and the English version

The difference between the English version and the French version is that in French morphology is more complex and thus finite verbs have a richer agreement pattern in French (while in English, it is only the third person, which is marked by an 's'). Infinite verbs only have one form, and thus we should expect a different effect in French. If we look at condition 1 (figure), and compare the performance of the English-speaking participants (in blue) with the French-speaking participants (red), we realise that the verb-final effect is bigger for French (S1, S2, S4, S6, S9, S10) and smaller for verb-medial structures (S3, S5, S7). So, we can say that the differentiation between finite and infinite verbs helped learning. Especially, we do not have a difference between lexical and auxiliary finite verbs. While in the English version, sentence 10, where the finite verb was an auxiliary verb, was judged as less 'correct' as sentence 1, we do not have a significant difference in the French version.

Figure: Comparison of Condition 1

Participants

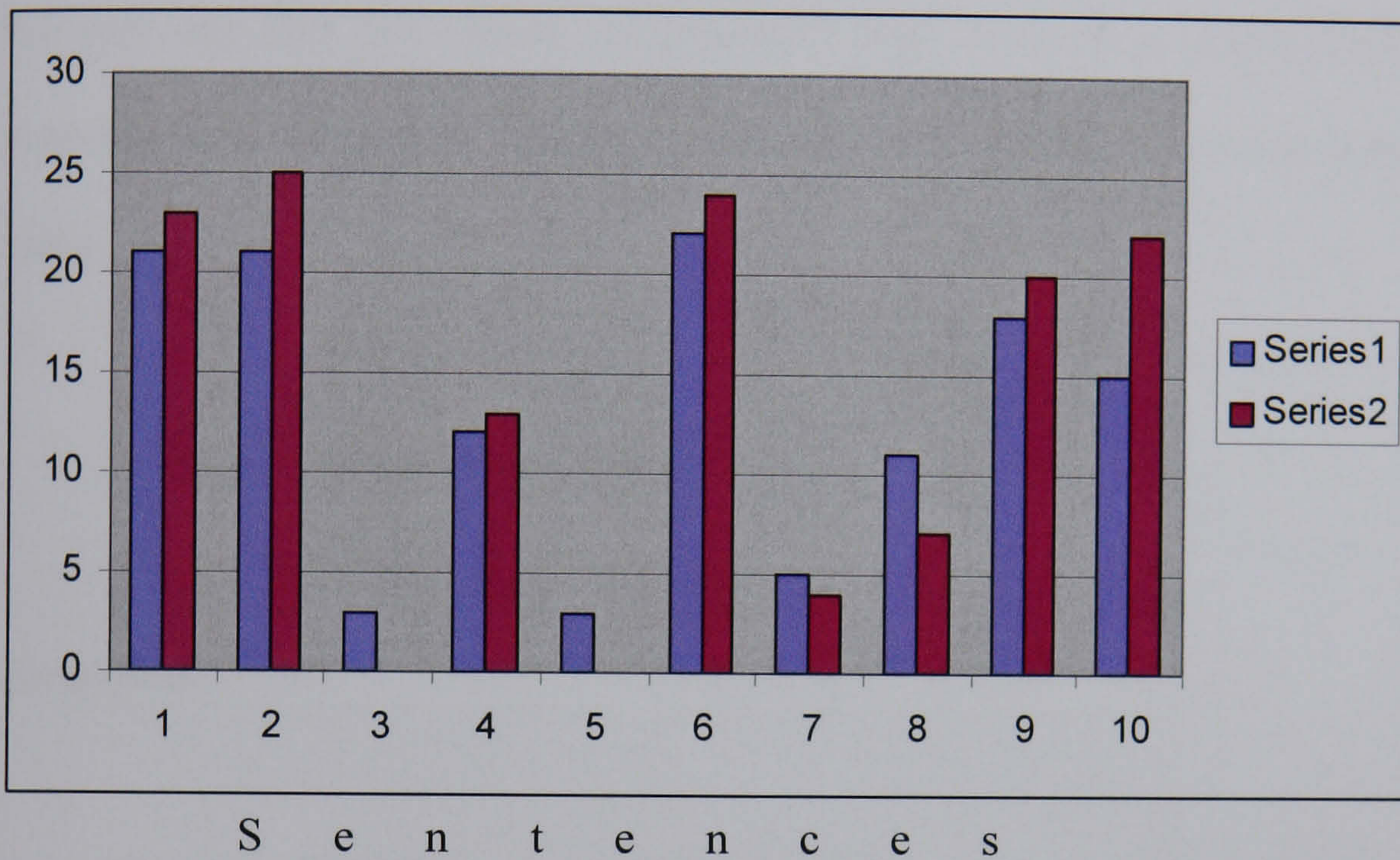


Figure 7.1

In condition 2, the infinite verb was in a ViO-position, but the finite verb still appeared in final position in subordinate clauses. Here again, we see that in the French version the final position of finite verbs (sentence 1 and 10) is still learned better than in the English version. The French performance is better in sentence 3, which has the main clause structure SVfViO, and was judged by more participants as 'correct' as in the English version. The same for sentence 4, which has the subordinate clause structure 'SOViVf, and is not correct because the infinite verb is in an OVi-position. Sentence 2 and 6 has the structure SVfOVi, and is incorrect because the infinite verb is in an OVi-position. Here again we see that more participants in the French-version refuted this sentence than in the English-version. Sentence 5, which has a subordinate clause structure

‘SVfViO’ was judged as ‘correct’ by 5 participants in both the English and French version. Sentence 7, which has a SVfO-structure and is correct according to the stimuli, was judged by more participants as ‘correct’ in the English version. Sentence 9, which has a subordinate clause structure ‘SvfOVi, was equally judged by more participants as ‘correct’ in the French version than in the English version.

We can say that the overall performance was better in the French-version of the experiment, and this must be due to a greater differentiation between finite and infinite verbs.

Figure: Comparison of Condition 2

Participants

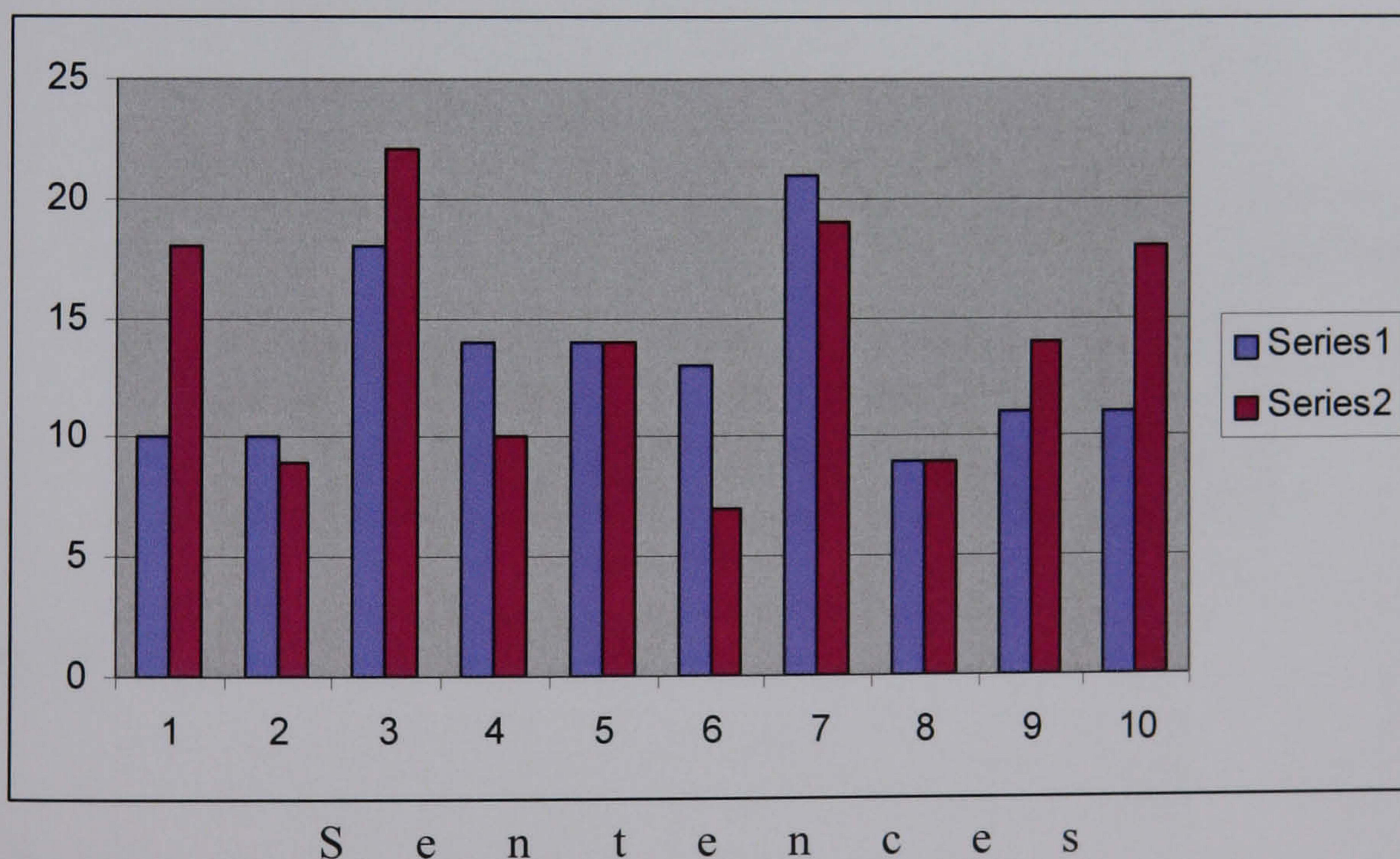


Figure 7.2

In condition 3, we only had 22 participants in the French-version compared to 25 participants in the English-version. For comparing the two conditions, I reduced the

English-version to 22 participants. In this condition the infinite verb was in final position in main clauses, but the finite verb occurred in medial position in subordinate clauses. Here again, we see that in the English version, more people assumed that the finite verb in subordinate clauses is final (S1 and S10), while in the French version more participants assumed that it can be medial. In the French version, we see again that the lexical verb is rather assumed to be final (S1) than the auxiliary verb (S10). The infinite verb in final position (S2 and S6) was judged by a majority in both groups to be 'correct'. We also get a difference in S8, which is an impossible structure, and in the French version more participants refuted it, as it was also the case in condition 1.

Figure: Comparison of Condition 3

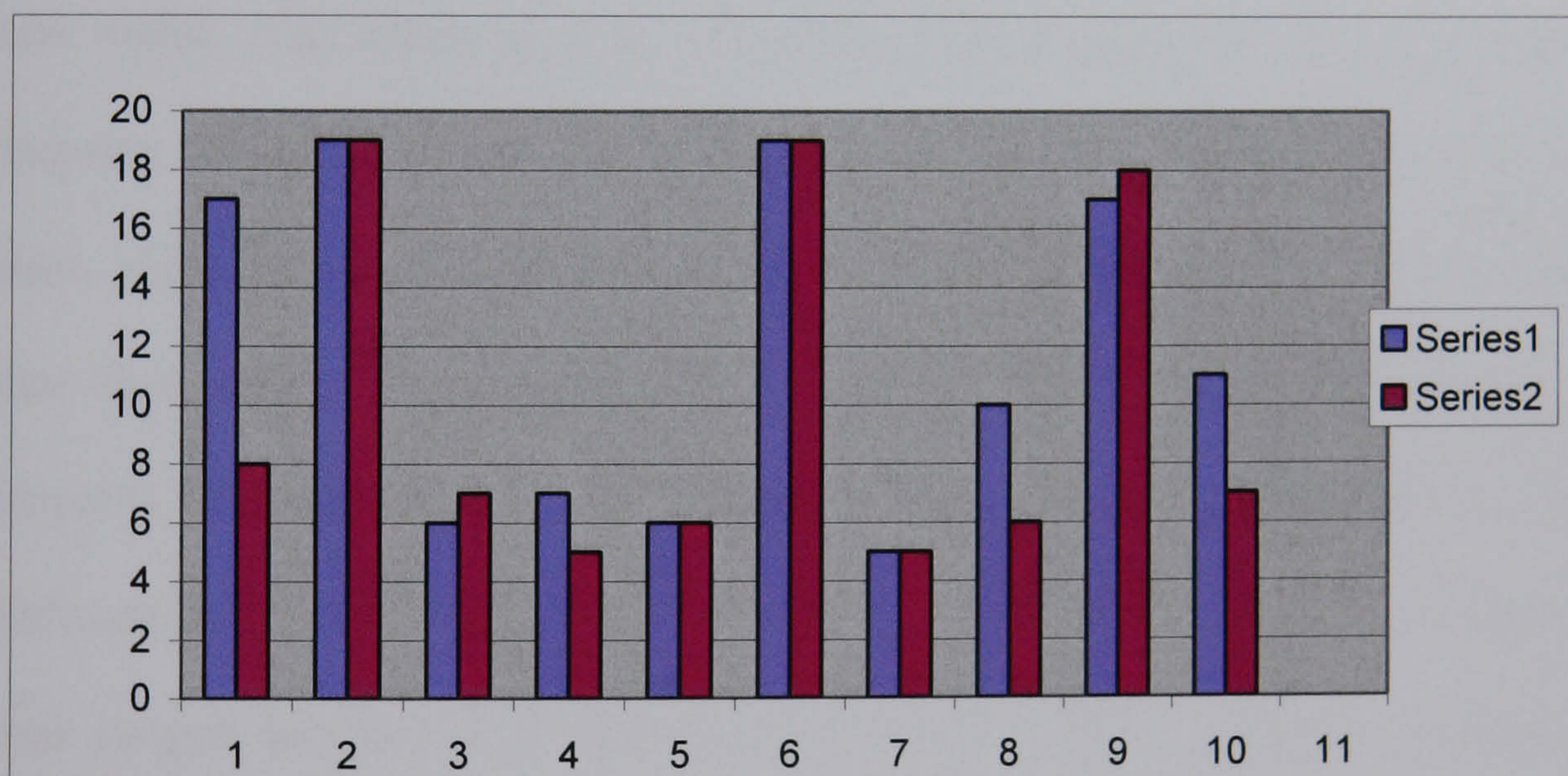


Figure 7.3

Conclusion

We have seen in the version of the experiment with French-speaking participants, that when the infinite verb is final and when the finite verb appears in final position in subordinate clauses (condition 1), that participants learn very easily that the finite verb

is in final position in subordinate clauses. There is a difference between lexical and auxiliary finite verbs. When the finite verb is an auxiliary (S10), the effect is weaker. In condition 2, the infinite verb is in medial position, thus ViO, but the finite verb still appears in final position in subordinate clauses. The finite verb in final position in subordinate clauses is refuted by most participants. In condition 3, the infinite verb appears in final position in main clauses, but the finite verb is in medial position in subordinate clauses. Participants assume that the finite verb can appear in final position. Generally, we can say that participants in the English-version assume that the language is verb-medial when the infinite verb is ViO and that the language is verb-final when the language is OVi. We can see here that the infinite verb can be a trigger in the setting of a language. Then, in the following, we did the same experiment in a French version. Then we could see what happens if we have a greater differentiation between finite and infinite verbs. The effect is even greater in the condition 1. But in condition 2, participants learn better than in the English-version that the finite verb is in final position, although the infinite verb occurs in a ViO-position. But the performance is weaker than compared to condition 1. The same for condition 3, where fewer participants assumed than in the English version that the finite verb be final in subordinate clauses. But we get the best result for condition 1, where for example only 2 persons judged sentence 1 as 'incorrect' and only 3 persons judged sentence 10 as 'incorrect' etc. (see figure). There is no difference between finite auxiliary and finite lexical verb, which tells us that morphology helps in learning verb-positioning. Participants learn better when information about verb morphology is included.

Chapter 8

Conclusion

Throughout this thesis, we examined different levels of inconsistencies. We looked at word order correlations, and then we took a look at recursive inconsistencies. We also examined how structures can emerge that do not fit with the basic word order type (German adpositions). Then we looked at how some inconsistencies might be established in the system through the aid of a ‘syntactic cue’ (the case of German infinite verbs). Now we will see a brief overview as a conclusion what has been done and what questions stayed open.

In the first chapter, we saw that among the world’s languages and the six different possibilities of word orders, which are SVO, OSV, VSO, OVS, SOV and VOS, two of them are the most frequent. SOV and SVO are the most frequent word orders, and SOV is more frequent than SVO. In accord to unidirectional change, which states that languages change from head-first towards head-last structures, thus from an SOV towards an SVO-type, which also includes the change from synthetic structures towards analytic ones, changes in the other direction, so from SVO towards SOV, is only observed in situations of language contact, where the dominant language is of an SVO-type (Bichakjian (1991)).

So, the question that is hard to answer is if the natural language change goes from SOV to SVO, why still most languages in the world are of an SOV-type. It might be that

many languages of this SOV-type belong to several big language families and that those occurring to SVO belong to many different language groups.

Indian language families are of the SOV-type but hundreds of languages belong to their group (Bichakjian (1991)).

Some structures accord more strictly with the head-position than others. The positioning of adjectives, for example, does not seem to fit much with any head-positioning. Thus, adjectives can precede or follow the noun in SOV-languages, and there is no statistical tendency for adjectives to follow the noun in SVO-languages. Thus, when speaking about consistencies and inconsistencies, we only discussed such structures that usually are either head-first in an SVO-language or head-last in an SOV-language. For example, like we can see in the literature of language topology, prepositions have a strong statistical tendency to appear in SVO-languages and postpositions in SOV-languages.

But still, in most languages we have a small set of inconsistencies. It is often argued that these inconsistencies are a result of language change (Hawkins, 1979). Then, the scenario is that languages are at some point totally consistent. When the change starts, some structures start changing, but not all at the same time. So the language is inconsistent, and there will be pressure to develop back into consistency again. Data, for example in Romance, seem to confirm this. But some inconsistencies exist for many years, even centuries, see that in French the pronoun still occurs in front of the verb. This scenario is unlikely in the sense that most languages have inconsistencies and thus we do not have a reason to suppose that at earlier stages, languages did not mirror a similar image.

So, in essence, inconsistencies exist in languages and they might have developed by historical accident.

Three different levels of inconsistencies

Depending on the phrase level, we can distinguish three different kinds of inconsistencies. We can find inconsistencies on an inter-phrase level, which means that the structures themselves are not inconsistent, but do not fit with other structures. In German, there is a basic V2-structure, while most sentences are SVfO, while in subordinate clauses, the finite verb appears in final position, usually SOVf.

Second, we find inconsistencies in an intra-phrase level. In German, noun phrases are head-first. Thus genitive phrases are following usually the pattern N Gen, but there is also a minority structure Gen N.

Thirdly, we find recursive inconsistencies. If for example the noun phrase is head-first, the head of an embedded adpositional phrase should be also head-first. So, if we have a Noun Phrase followed by a postpositional phrase. A noun phrase is then recursively inconsistent if the noun phrase contains an adpositional phrase, which contains NPs.

German as a case study

When we considered the case of the positioning of the verb in German, we looked at how inconsistencies at the inter-phrase level can be acquired and we came to the conclusion that the infinite verb acts as a syntactic cue.

Positioning of the verb in German

Further on, we looked at a language that is quite mixed for several reasons. German can have SOVf-structures as well as SVfO-structures. Although SVfO-structures seem to be more frequent in German, German is considered by generative linguists as a language that has a basic SOV-structure.

There are two basic models concerning the verb-positioning in German. First, we have seen the Clahsen's model, where V2 and SVfO is attributed to movement of the finite verb in the complementizer, while this movement is blocked in subordinate clauses because this movement is blocked by the presence of the conjunction in the complementizer. While in the Clahsen's model, SVO is part of a V2 structure explained by the same movement, in the Travis' Model, SVO and V2-structures take place at different times.

Further on, and this is an important aspect for the following, the infinite verb, so the verb that does not have an agreement pattern, always appears in a position after the object. This means that the infinite verb is in final position in main clauses, so we have SVfOVi.

SRN-simulation

We showed in an SRN-simulation, that the acquisition of verb positioning in subordinate clauses depends on the position of the infinite verb, which occurrence is statistically more frequent.

Experiments

In an experiment with English speakers, we replicated this result from the SRN-simulation. When the infinite verb is final, subordinate clauses with a SOVf is acquired better than when the infinite verb is in a position preceding the noun.

When the infinite verb is medial, but the finite verb still appears in final position, participants do not learn the construction.

We replicated this experiment in French, and we have seen that the greater distinction between finite and infinite verbs help the acquisition. This speaks in favour of the 'Full Competence Hypothesis' in so far that it shows that when people distinguish between finite and infinite verbs, acquisition is more efficient.

German Noun Phrases and Adpositional Phrases

German's noun phrases exhibit rather first-head structures, thus structures belonging to a VO-language. Thus, the basic genitive phrase is N Gen, but there is also a minority Gen N construction. German's adpositional phrases follow the noun, thus N PP.

According to Hawkin (1979), German must belong to the OV-type, because it has exclusive ADJ+N and Gen N-structures.

Head-first languages are expected to have prepositions, which is the case for German.

Postpositions exist in German, but they are minority structures.

So, basically, we can say that although German's verb positioning follow clear OV-structures, Noun Phrases are rather of the VO-type.

Word Order phenomena from a historical perspective

How do the phenomena develop we have seen. First let us consider the development of verb-positioning. It does not seem to be accidental that German has still an SOVf order in subordinate clauses. This is a phenomenon, we can observe across languages and language families. SOV in subordinate clauses is more stable and survives longer. If our observation for German and Old English is universal, it should be the case that as long as infinite verbs can appear in final position, there would be SOVf-subordinate clauses.

Unidirectionality and Grammaticalisation

Grammaticalisation is the process where lexical elements develop towards more syntactic markers. A classical example is the French negation marker 'ne ... pas' where pas had an original meaning of step, and this negation marker could only be used with verbs of movement. In the course of language change, 'pas' lost its semantic meaning and nowadays it can be used with all verbs.

The process of grammaticalisation is unidirectional because once an item like 'pas' is grammaticalised, it cannot be lexicalised anymore.

Adpositional Phrases in diachronicity

According to Lehmann, Hawkins and Bauer (1995b), German used to be already a language, which only had prepositions. In the 17th century, then, postpositions emerged.

We would not expect this, when we consider that a language changes more and more

towards a right-branched language. Bauer (1995b) speaks of a retrograde change and such as Hawkins and Lehmann, she argues that OV-structures have been introduced. We have seen that German continued to develop towards more right-branched structures. The introduction of postpositions is rather a process of grammaticalisation, and when these elements occurred, they further on underwent the process of right-branching, and thus most postpositions developed towards prepositions in the following. The grammaticalisation of infinite elements towards postpositions is under certain aspects quite similar to the role the infinite verb plays in the acquisition of word order. The particle, which can be a verb particle or an infinite verb, does not have an agreement pattern and appears in a position following the noun. As we have seen in the case of the acquisition of verb orders, the infinite verb acts as a 'syntactic cue', which helps learners acquiring subordinate clauses. Children use infinite verb constructions without a finite verb. Infinite verb elements are easier for acquisition because of the lack of agreement patterns. The verb particle is an infinite verb element, and thus as we have seen in children's language acquisition, such an element can be easily used isolated from its finite verb and such it can be also more easily reanalysed. So, for giving an example, let us consider then that we have a finite verb 'to go' with as a complement its infinite verb element 'along': *Ich **gehe den Weg entlang** und sehe viele Blumen* ('I go the way **along** and see many flowers'), which then can be isolated from its finite verb, thus we get as a postpositional phrase (in bold): ***Den Weg entlang** sehe ich viele Blumen* (The way along see I many flowers).

We also have seen that only those particles can be reanalysed that can be fronted. Verb particles that occur in transparent constructions can be reanalysed, but not those that occur in idiomatic constructions. Verb particles in transparent constructions are more independent in meaning since they can occur with different verbs, while particles in

idiomatic constructions are rather bound to the meaning of the verb they occur with. So to take an example if we consider a verb particle that occurs in an idiomatic construction such as 'to eat up' as in 'to eat up the soup', we see easily that 'up the soup' without the support of its verb, does not make much sense. But, if we take 'the way along' we realise that this particle is less dependent on a particular verb and so it is not surprising that it can occur with a set of different verbs independent of the particle as 'The way along I see flowers'.

Postpositions developed out of verb particles and once they got grammaticalised they had to be used as prepositions. So, we cannot really speak of a retrograde change, but rather of a process of reanalysis where particles that could only be used with verbs got extended to nouns.

Outlook

In the research of language change, we have two views, which seem to be empirically both valid. First, we have the view that languages develop from an OV-type towards a VO-type, and that the protolanguage was thus SOV (Newmeyer, 1991). The problem that arises immediately is that still a majority of the languages are of the OV-type, although languages are spoken already for many thousand of years. But, diachronical data only describe changes from the OV-type towards the VO-type, which we called earlier on right-branching. The change is also accompanied by changes in the morphological structure, while OV-languages usually have synthetic structures, VO-languages are rather analytic. This seems to be in contrast with 'grammaticalisation', where researchers claim that lexical items become grammatical ones. In such a way, case markers can evolve. The lexical item loses much of its semantic meaning, which is called 'semantic bleaching' and becomes more and more functional and through

fusion becomes adjacent to the noun. So, we see here that analytic structures become more synthetic, which has been observed in a number of languages. But, grammaticalisation seems to be opposite to the observation that languages go through a process of right-branching. The mechanisms have to be better understood in the future, when and how processes of right-branching and grammaticalisation interact.

In Chapter 5, we spoke about a retrograde change in German, the introduction of postpositions, and we have seen that the change is actually not against the general tendency. Other so called 'retrograde changes' have to be examined like for example the re-emergence of postpositions in Latin mentioned by Bauer (1995b).

Concerning the infinite verb as a syntactic cue, more work could be done of course in several languages. For a historical perspective, we could try to implement in a network diachronical stages of language changes. Padraic Monaghan suggested (personal communication) to implement changes in the verb phrase at different stages in the development of English to see at which point the evidence was not enough to keep verb-final structures, and then to see how important the infinite verb as a cue actually is.

In this thesis, I tried to sketch out how 'inconsistencies' make sense in the language system. We have seen that they often develop as a consequence of language change, but that they have still to make sense in the present language system for children acquiring such a language. We have seen that postpositions are often in-between two categories and that their closeness to verb particles and the ability of fronting can trigger the emergence of postpositions in German. Recursive inconsistencies can be observed in different languages, but at least in German we have seen that they occur for the same reason as for the emergence of postpositions. Further on, we have seen the role of the

infinite verb, which can explain how children acquire a minority structure and also why it did not disappear in language history.

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