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Coherence: A Dependency Grammar Analysis

Abstract

Bech's seminal distinction between coherent and incoherent constructions in German does not allow for those structures that display the traits of both coherence and incoherence simultaneously, e.g. the third construction. Hence his original two-way distinction has given way to a three-way distinction. This paper proposes that a three-way division is indeed more accurate. The approach presented here distinguishes between coherent, incoherent, and pseudoincoherent constituents. Nine diagnostics are utilized to support this three-way division, i.e. extraposition, intraposition, bare infinitive fronting, infinitival fronting, scrambling, pied-piping, position of negation, scope of negation, and gapping. The analysis is couched in a dependency grammar framework and formalized in terms of the two features $\pm s$ (scrambling) and $\pm p$ (predicate). Three principles of word order are formulated in terms of these features: the Scrambling Principle, the Predicate Serialization Principle, and the Predicate Weight Principle. An introduction to dependency grammar is provided.

1. Coherence

Most studies of nonfinite verb constructions in German build on, or modify, Bech's (1955) seminal work on coherence fields. Bech discerns between coherent and incoherent constructions. He groups verbs according to the type of construction in which they appear.

- (1) a. Thomas braucht die Zeitung nicht zu lesen.
Thomas needs the paper not to read
'Thomas doesn't need to read the paper.'
- b. *weil Thomas nicht braucht, die Zeitung zu lesen
'because Thomas doesn't need to read the paper'
- c. weil die Zeitung Thomas nicht zu lesen braucht

- (2) a. Thomas fordert mich auf, die Zeitung zu lesen.
 Thomas encourages me up the paper to read
 ‘Thomas is encouraging me to read the paper.’
- b. weil Thomas mich auffordert, die Zeitung zu lesen
 ‘because Thomas encourages me to read the paper’
- c. *weil Thomas mich die Zeitung auffordert zu lesen
- (3) a. Thomas versucht, die Zeitung zu lesen.
 Thomas tries the paper to read
 ‘Thomas tries to read the paper.’
- b. weil Thomas versucht, die Zeitung zu lesen
 ‘because Thomas tries to read the paper’
- c. weil Thomas die Zeitung versucht zu lesen

The examples (1a–c) illustrate that *nicht brauchen* ‘not need’ constructs coherently. According to Bech (1955: 75), a central trait of coherent constructions is that the infinitival phrase may not be extraposed as in (1b). Sentence (1c) demonstrates another trait of coherent constructions observed by Bech (1955: 61f., 74f.): they allow the discontinuities of overlapping verb fields. The examples (2a–c) illustrate that *auffordern* ‘encourage’ can construct incoherently: the *zu*-infinitive phrase *die Zeitung zu lesen* ‘to read the paper’ can be extraposed, as in (2a–b), and the complement of the *zu*-infinitive, i.e. *die Zeitung* ‘the paper’, may not appear in a position resulting in a discontinuity, as shown in (2c).

Bech’s theory in terms of coherence fields is challenged by example (3c), though. His analysis assumes two construction types, i.e. coherent vs. incoherent, whereby many verbs have the option to construct coherently or incoherently. This delineation of phenomena implies that a construction can be either coherent or incoherent, but it does not allow for a construction to demonstrate the traits of both coherence and incoherence simultaneously. Example (3c) is hence problematic because it simultaneously demonstrates the discontinuity of a coherent construction and the extraposition of an incoherent construction. This difficulty with Bech’s work is widely acknowledged. Discussions of the problem – e.g. Besten and Rutten (1989), Kiss (1995: 109ff.), Hinrichs and Nakazawa

(1998), Müller (1998: 189ff.), Wöllstein-Leisten (2001: 8), Rambow (2003: 232), Reis and Sternefeld (2004: 488ff.) – focus on the discontinuity of the *third construction*, which is illustrated in (3c). Typical instances of the third construction have the object of the embedded *zu*-infinitive appearing in the *Mittelfeld* ‘middle field’, whereas the *zu*-infinitive itself is extraposed.

Due to the difficulties posed by the third construction to Bech’s theory, a three-way distinction is now acknowledged, cf. Wöllstein-Leisten (2001: 67). The need for this three-way distinction is further illustrated in the following contrast.

- (2) d. *Aufgefordert zu lesen hat mich Thomas die Zeitung.
 e. *Zu lesen aufgefordert hat mich Thomas die Zeitung.
 f. *Zu lesen hat mich Thomas die Zeitung aufgefordert.
- (3) d. Versucht zu lesen hat Thomas die Zeitung
 e. Zu lesen versucht hat Thomas die Zeitung.
 f. Zu lesen hat Thomas die Zeitung versucht.

Auffordern and *versuchen* both allow extraposition, as illustrated in (2a) and (3a). In this regard, they are similar. Examples (2d–f, 3d–f) illustrate, however, that *auffordern* disallows certain discontinuities, whereas *versuchen* allows these discontinuities. In order to allow for this contrast, a three-way distinction is necessary.

This paper presents a dependency grammar analysis of coherence in German. In place of Bech’s two-way distinction, a three-way distinction is adopted. The approach distinguishes between coherent, incoherent, and pseudoincoherent constituents. This three-way division is formalized in terms of two features that appear on the root words of the constituents involved.¹ The feature $\pm s$ (scrambling) addresses the extent to which the rising of scrambling is allowed, and the feature $\pm p$ (predicate) addresses the positional restrictions on that constituent. These features help establish three core principles of word order in German: the Scrambling Principle, the Predicate Serialization Principle, and the Predicate Weight Principle. The topological model as it is commonly understood results from the interaction of these three principles with the V2 principle. To my knowledge, a dependency grammar theory of coherence is lacking.

¹ The term “root” is defined in section 3.1. The root of a constituent is the highest word in that constituent.

2. Confusion in the literature

The manner in which ‘coherence’ is discussed and employed in the literature varies greatly. The terminology is inconsistent and at times contradictory. The confusion is at least in part due to the fact that Bech himself was not clear about the criteria that must be fulfilled in order for a construction to qualify as coherent or incoherent – see Kvam (1979), Stechow (1984), and Grewendorf (1988: 267, 274ff.) in this regard.

One can distinguish between two opposing stances. The one stance defines ‘coherence’ in terms of a single criterion, namely the position of the infinitival phrase in relation to the verb that immediately governs it. If the infinitival phrase precedes its governor, e.g. it is center-embedded, one is dealing with a coherent construction. If the infinitival phrase follows its governor, e.g. it appears in the *Nachfeld* ‘after field,’ one is dealing with an incoherent construction.

- (4) a. Er fährt zu arbeiten fort. - Coherent construction
 he drives to work further
 ‘He continues to work.’
- b. Er fährt fort zu arbeiten. - Incoherent construction

The only thing that counts is the serial position of the infinitival phrase in relation to the right bracket. Following Eisenberg (1999: 495), this understanding of coherence shall be referred to as the *topology stance*.

The second possibility understands coherence in terms of subcategorization, whereby numerous criteria, not just one, are employed to distinguish coherent from incoherent constituents, e.g. extraposition, intraposition, bare infinitive fronting, infinitival fronting, scrambling, pied-piping, the position of negation, the scope of negation, gapping, etc. A verb like *fortfahren* ‘continue’ subcategorizes for an incoherent *zu*-infinitive, and this *zu*-infinitive is incoherent regardless of whether it precedes or follows the right bracket:

- (4’) a. Er fährt *zu arbeiten* fort. - Incoherent constituent
 b. Er fährt fort *zu arbeiten*. - Incoherent constituent

This understanding of coherence shall be referred to as the *subcategorization stance*.

As Eisenberg (1999: 495) notes, the manner in which the terminology on coherence is employed in the literature quite often confuses these two stances. To illustrate this fact, the discussion here shall consider three ways in which linguists employ the terminology on coherence. The literature distinguishes between

1. Coherent vs. incoherent constructions,
2. Coherent vs. incoherent verbs, and/or
3. Coherent vs. incoherent infinitives.

Even though these terms are mixed and matched in various ways, it is fair to acknowledge these three areas. Each of these oppositions shall be considered in turn.

Coherent vs. incoherent constructions: For the most part, the manner in which the terms *coherent* vs. *incoherent construction* are employed is consistent with the topology stance, e.g. Kvam (1982), Stechow (1990), Kiss (1994, 1995), Hinrichs and Nakazawa (1998), S. Müller (2002). That is, a coherent construction is defined solely in terms of the position of the infinitival phrase with respect to its governor. If the infinitival phrase is center-embedded, a coherent construction obtains. If it is extraposed, an incoherent construction obtains. None of the other criteria used to determine coherence are needed.

Coherent vs. incoherent verbs: The use of the terms *coherent* vs. *incoherent verb* is less clear – see Stechow (1990), Eisenberg (1999: 353), De Kuthy and Meurers (2001), Rambow (2003). A coherent verb obligatorily constructs coherently, i.e. it appears only in coherent constructions. An incoherent verb in contrast, like *fortfahren* in (4), has the option to construct coherently or incoherently, i.e. it can appear in a coherent or incoherent construction. The grouping of verbs according to the type of construction in which they appear is an attempt to acknowledge subcategorization traits. Hence the use of these terms takes a significant step in the direction of the subcategorization stance. The problem with these terms, though, is that those verbs that are labeled “incoherent” actually have the option to appear in coherent or incoherent constructions. Thus it can occur that an incoherent verb constructs coherently, which is a contradiction in terms.² The only way around this contradiction would be to

² De Kuthy & Meurers (2001) provide a good example of this contradiction in terms. They acknowledge obligatorily coherent (e.g. *scheinen* ‘seem’, *pflügen* ‘usually do’,

posit two lexical entries for each of the verbs. A verb like *fortfahren* would have an entry as a coherent verb and an entry as an incoherent verb. To increase the number of lexical entries in this manner would be to mistakenly situate an aspect of coherence in the lexicon that belongs in the syntax.

Coherent vs. incoherent infinitives: Some linguists apply the terms *coherent* and *incoherent* to the embedded verbs rather than to the matrix verbs, e.g. Fanselow (1989), G. Müller (1998: 17ff.), Sabel (1999). This use of the terminology is very close to the subcategorization stance. An infinitival phrase is deemed to be coherent or incoherent regardless of whether it is center-embedded or extraposed. The *zu*-infinitive *zu arbeiten* in (4), for instance, is incoherent in both (4a) and (4b). The linguists who use the terminology in this manner generate confusion, though, when they also employ the terms *coherent vs. incoherent construction*. An incoherent *zu*-infinitive can appear in a coherent construction as in (4a), again a contradiction in terms.

The dependency grammar approach developed below is not confronted with these difficulties. Its use of the terminology is entirely consistent with the subcategorization stance. In fact, it is not possible for dependency grammar to acknowledge the topology stance. Dependency structures cannot, namely, be understood in terms of *constructions*. According to Wells (1947), a construction is a sentence or constituent that can be broken down into two or more immediate constituents. Thus only terminal constituents fail to qualify as constructions. An immediate constituent analysis of this sort is not applicable to dependency structures. A non-terminal constituent in dependency grammar cannot be understood in terms of the immediate constituents of which it consists, but rather it can only be broken down by separating off the constituents lower in the hierarchy. This point becomes evident in the next section where some fundamentals of dependency grammar are presented.

With the inability of dependency grammar to produce immediate constituent analyses, the possibility to use the term *construction* is absent. Therefore the terminology that is most closely associated with the topology stance, i.e. *coherent vs. incoherent construction*, should not be employed in

bekommen ‘receive’), optionally coherent (e.g. *versuchen* ‘try’, *wagen* ‘dare’, *hoffen* ‘hope’), and obligatorily incoherent verbs (e.g. *auffordern* ‘encourage’, *begehren* ‘desire’, *fortfahren* ‘continue’). Even though the latter are obligatorily incoherent, they have the option to appear in coherent constructions, e.g. *fortfahren* in (4a).

a dependency grammar theory of coherence to begin with. This situation is beneficial since it reduces the source of confusion.³

3. Dependency grammar

Since dependency-based grammars are seldom in comparison with constituency-based ones, an introduction to the framework is warranted. This introduction is accomplished here by contrasting dependency with constituency. Comparisons of the two – e.g. Baumgärtner (1970), Anderson (1979: 92ff.), Hudson (1980), Matthews (1981 Ch. 4), Engel (1982: 27ff.), Mel'čuk (1988: 12ff.), Siewierska (1988: 142ff.), Jung (1995: 15ff.), Eroms (2000: 75ff.), Hudson (2000: 20ff.), Tarvainen (2000: 11ff.) – emphasize that constituency is a part-whole relation, whereas dependency is a strict mother-daughter relation. The part-whole relation is a result of syntactic units *combining* with each other to form greater units. The mother-daughter relation, in contrast, is a result of syntactic units *attaching* to each other, the result being a greater unit. The distinction is best understood in terms of the tree structures that each approach generates:

³ An anonymous reviewer comments that the topology vs. subcategorization dichotomy established here is not warranted and that both views of coherence are necessary. The reviewer writes:

“Ich möchte behaupten, dass unterschiedliche infinitivregierende Elemente für Infinitive mit unterschiedlichen topologischen Eigenschaften subkategorisiert sind, d.h. ich halte beide Begriffe für gleich empirisch und deskriptiv notwendig.“

‘I would maintain that different governors of infinitives subcategorize for infinitives having different topological characteristics, i.e. I think both concepts are equally empirically and descriptively necessary.’

I do not disagree with this statement; using topology to describe the behavior of coherent/incoherent constituents is indeed quite useful. The statement does not, however, address the core definition of coherence. The problem is that if you define coherence in terms of topology, then certain verbs require two lexical entries (e.g. *fortfahren*): one entry has the verb appearing in a coherent construction and the other has it appearing in an incoherent construction. In so doing, you have missed a generalization by situating coherence in the lexicon. However, if you define coherence in terms of subcategorization as done here, then you have considerably reduced the size of the lexicon by situating coherence in the syntax. Stated another way, I am arguing that topology should be used to describe the subcategorization traits of verbs, not vice versa.



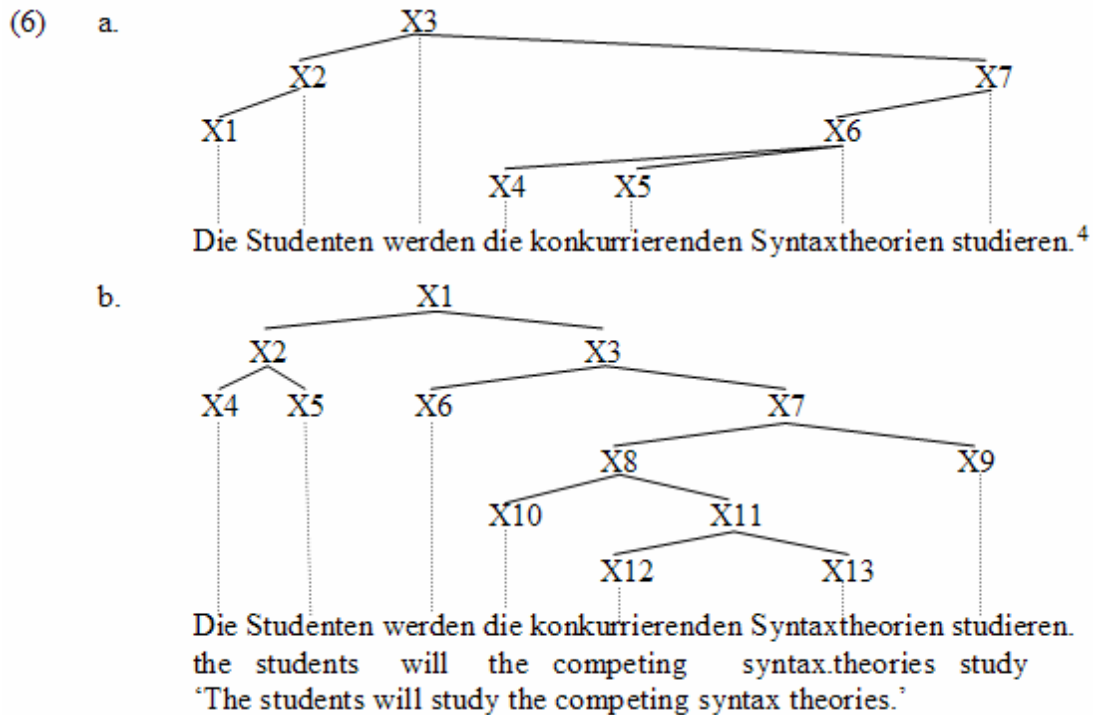
The constituency tree (5a) illustrates the manner in which syntactic units combine to create greater units. The word *sie* X2 combines with the word *bleibt* X3 to create the sentence X1. The dependency tree (5b) shows that dependency has the words attaching to each other. The daughter word *sie* X1 attaches to its mother word *bleibt* X2, the result being a sentence. Notice that there are two words in the string but three nodes in the constituency structure (5a). In contrast, there are two words in the string and exactly two nodes in the dependency structure (5b).

The difference between constituency and dependency can indeed be understood in terms of the word-to-node ratio. Consider the following principles of tree construction:

- I. a. One word per node, and
b. One node per word.
- II. One head per node, and
- III. One root node per structure.

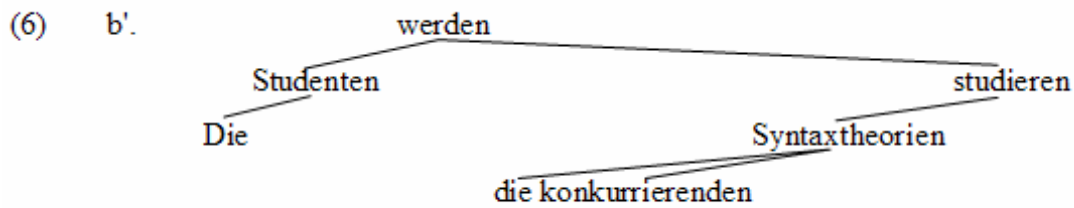
Dependency and constituency alike generally adhere to principles Ia, II and III. They differ, however, with respect to Ib. The projections of constituency structures necessitate the presence of ‘higher nodes’, e.g. X1 in (5a). The presence of higher nodes means that the number of nodes in the structure always outnumbers – by at least one – the number of words in the string. The absence of such projections in dependency structures, in contrast, results in a situation where no higher nodes are present, meaning the number of nodes in the structure is the same as the number of words in the string. Dependency can hence be understood as a one-to-one relation, whereas constituency is a one-to-more-than-one relation.

The one-to-one relation of dependency results in syntactic structures that generally contain half the number of nodes and edges as the corresponding constituency structures. Despite this paucity of structure however, dependency inherently conveys information that constituency does not.

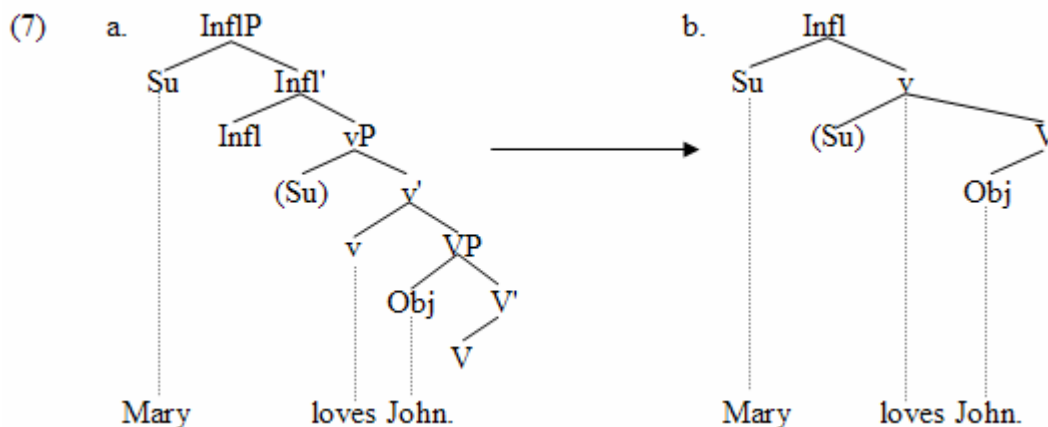


In the dependency tree (6a), it is visible that *Studenten* is the head of *die*, that *werden* is the head of *die Studenten* and *die konkurrierenden Syntaxtheorien studieren*, that *studieren* is the head of *die konkurrierenden Syntaxtheorien*, and that *Syntaxtheorien* is the head of *die* and *konkurrierenden*. In the constituency tree (6b), in contrast, the head-dependent relation is not visible. It is not apparent for instance whether *die* or *Studenten* is the head of *die Studenten*, or whether *konkurrierenden* or *Syntaxtheorien* is the head of *konkurrierenden Syntaxtheorien*, etc. In order to convey this information, constituency syntax must include the category labels of the phrase markers; the status of the various projection levels – i.e. minimal, intermediate, maximal – must be visible on the node labels. Dependency structures, in contrast, can be further reduced by collapsing the word-node distinction altogether. The words are positioned directly in the hierarchy in the following manner:

⁴ This paper is consistent insofar as the node labels in the dependency trees always have the linear index of the word.



The question arises as to whether an approach is possible that combines aspects of constituency and dependency. In other words, is a hybrid system possible? I believe the telescope principle of Brody's (1998, 2003) Mirror Theory does just that, i.e. it results in a hybrid system. The telescope principle collapses the minimal, intermediate, and maximal projections of a lexical item into a single node. The following trees are adapted from Brody (2003: 252f.):



The structure (7b) results when the various projection levels of the lexical items in (7a) are each collapsed into a single projection. That is, Infl-Infl'-InflP, v-v'-vP, and V-V'-VP are all collapsed to the single nodes Infl, v, and V, respectively. The tree (7b) qualifies as a hybrid dependency-constituency tree because it has one non-terminal node occupied but the others unoccupied by lexical items. In this regard, compare the pure dependency tree (6a) and the pure constituency tree (6b) with the hybrid tree (7b). Pure constituency structures such as (6b) have only the terminal nodes (X4, X5, X6, X10, X12, X13, X9) occupied by lexical items; the nonterminal nodes remain unoccupied. Pure dependency structures such as (6a), in contrast, have all nodes, regardless if they are terminal or nonterminal, occupied by lexical items. In this respect, (7b) is indeed a hybrid structure since it has one non-terminal node (v) occupied, and the

other two non-terminal nodes unoccupied (Infl and V) by lexical items. The dependency grammar utilized in this paper is based on pure dependency structures, not on hybrid structures. The reason for mentioning the hybrid system here has been to further illuminate the dependency vs. constituency distinction. See Matthews (1981: Ch. 4) for further discussion on the possibility of hybrid systems.

The dependency structures produced in this paper are consistent in relevant respects with a long and established tradition, e.g. Tesnière (1959/69), Hays (1964), Robinson (1970), Kunze (1975), Matthews (1981), Engel (1982), Miller (1985), Mel'čuk (1988), Schubert (1988), Starosta (1988), Lobin (1993), Pickering and Barry (1993), Jung (1995), Heringer (1996), Groß (1999), Eroms (2000), Kahane (2000), Tarvainen (2000), Hudson (1984, 1990, 2000, 2003), Osborne (2003, 2005a), etc. There are a number of areas where these linguists are almost unanimous in their views. For instance, in surface syntax the subject is a dependent of the finite verb,⁵ the object is a dependent of the infinitival verb (assuming one is present), the infinitival verb is the daughter of the finite verb, the full verb is the daughter of the auxiliary verb, etc. One prominent point of disagreement is the status of determiners, i.e. NP vs. DP.⁶ Since this area does not bear directly on a theory of coherence, it will not be addressed in this paper. NP is assumed.

A major strength of dependency grammar is its structural minimalism. This strength is evident when the need arises to demonstrate graphically the structures and principles of syntax. Dependency trees are easily produced and can hence be utilized often to illustrate the principles of syntax under investigation. The numerous dependency trees in this paper bear witness to this point.

3.1 Constituents, roots, heads, dependents, mothers, daughters, and governors

The following terminology shall be used to describe the surface structural relations that obtain between the units of syntax in dependency structures.

⁵ Whether or not the subject is understood as a dependent of the nonfinite verb that then obligatorily rises shall not enter into the discussion. The important point for the purpose of this paper is that the subject is always a dependent of the finite verb in surface syntax.

⁶ Another possibility is that determiner and noun are interdependent. Eroms' (1988) *Doppelkopf* 'dual head' analysis pursues this possibility.

Constituent: A word plus all the words that that word dominates.

Root: The one word in a given constituent that is not dominated by any other word in that constituent.

Head: The one word that immediately dominates a given constituent.

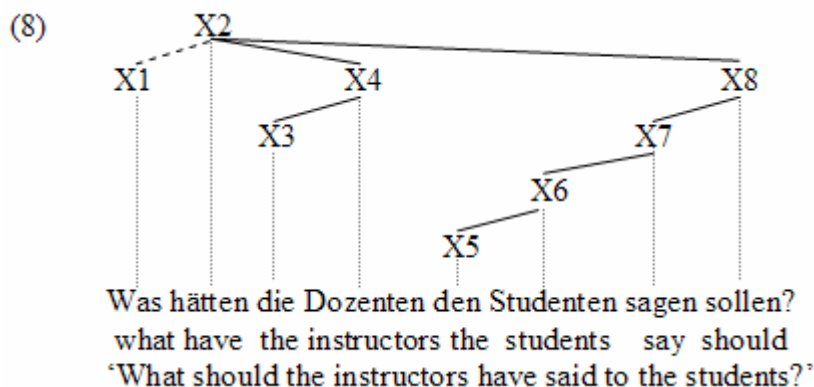
Dependent: A constituent that is immediately dominated by a given word.

Mother: The one word that immediately dominates a given word.

Daughter: A word that a given word immediately dominates.

Governor: The one word that licenses the appearance of a given word, constituent, or dependent.

The one-to-one relation (nodes to words) inherent in dependency structures makes it possible to collapse the node-word distinction entirely, as illustrated in (6b') above. Accordingly, these definitions refer to “words” only, whereby “word” is the same as “node”. The paragraphs below discuss these seven units using the following dependency structure. The nature of the dashed dependency edge connecting X1 to X2 is discussed below in section 3.2.



Constituents: It is not common for dependency grammars to view syntactic structure in terms of constituents. This aspect of dependency grammar is, though, just a matter of terminology. Dependency grammarians use various terms to denote the syntactic unit defined in the definition. Tesnière (1959/69: 14) calls the unit a *nœud* ‘node’; Kunze (1975: 13) names it a *vollständiger Teilbaum* ‘complete partial tree’; Hays (1964: 520) and Mel’čuk (1988: 14) call it a *subtree*; Groß (1999: 69) and Eroms (2000:86ff.) call it a *phrase*. Pickering and Barry (1993: 865) use the term *full-constituent*. Hudson (1984: 92) and Siewierska (1988: 142) use the term *constituent*. This paper follows Hudson and Siewierska in this regard. There are hence seven constituents in (8): *was* X1, *die* X3, *die Dozenten* X3 X4, *den* X5, *den Studenten* X5 X6, *den Studenten sagen* X5

X6 X7, and *den Studenten sagen sollen* X5 X6 X7 X8. Note that the single words *hätten* X2, *Dozenten* X4, *Studenten* X6, *sagen* X7, and *sollen* X8 do not each alone qualify as a constituent since they dominate other nodes. Due to this aspect of dependency hierarchies, dependency constituent structure differs a lot from constituency constituent structure.

Roots vs. heads: When focusing on a given constituent, it is advantageous to distinguish between the one word that is supreme in that constituent, i.e. the *root* of that constituent, and the one word appearing outside of that constituent to which that constituent is connected, i.e. the *head* of that constituent. Consider the constituent *die Dozenten* in (8): *Dozenten* is its root and *hätten* is its head. Consider the constituent *den Studenten sagen*: *sagen* is its root and *sollen* is its head. The root-head distinction is not possible in constituency grammar, which can only acknowledge heads.

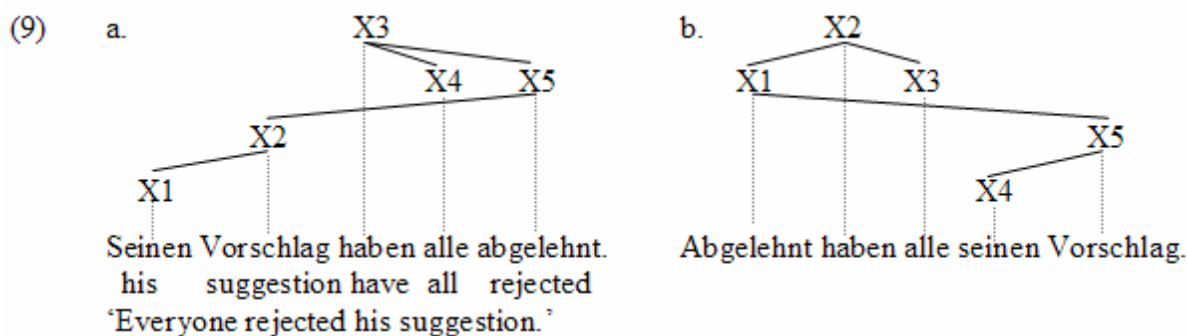
Dependents, mothers, and daughters: At times it is necessary to distinguish between the word(s) that a given word immediately dominates, i.e. its daughter(s), and the constituent(s) that that word immediately dominates, i.e. its dependent(s). Consider for instance the word *hätten* in (8): its daughters are *was*, *Dozenten*, and *sollen*, whereas its dependents are *was*, *die Dozenten*, and *den Studenten sagen sollen*. Consider next the word *sagen*: it has one daughter, i.e. *Studenten*, and one dependent, i.e. *den Studenten*. If one looks up the hierarchy from a given node, then the one node that immediately dominates that node is its mother, e.g. focusing on *sagen*, *sollen* is its mother. A word may have more than one daughter, but never more than one mother.

Heads vs. governors: The head-governor distinction is necessary to address the various discontinuities that occur in the grammar. The term *head* refers to an aspect of surface configurations. The term *governor*, in contrast, refers to an aspect of subcategorization. In most cases, the head and the governor of a dependent are one and the same word. When discontinuities occur however, the assumption is that the relevant constituent has taken on a higher word as its head. That is, it has taken on a word as its head that is not its governor. In (8) for instance, the head of *was* is *hätten*, but the governor of *was* is *sagen*. *Sagen* qualifies as the governor of *was* because *sagen* subcategorizes for an (accusative) object, meaning it is *sagen* that licenses the appearance of *was*. The head-governor distinction has precedents in the dependency grammar literature. Where the current system employs the term *head*, Bröcker (2000: 253) uses the term “linear governor”, and Hudson (2000: 32) the term “surface parent”. And where

the current system employs the term *governor*, Bröker (2000: 253) uses the term “syntactic governor”, and Hudson (2000: 32) the term “extra parent”. It should be apparent that the head-governor distinction is in general the means by which dependency grammar addresses discontinuities of every sort.

3.2 Projectivity and Rising

Dependency grammar defines discontinuities in terms of crossing lines. If a projection line crosses a dependency edge, then a discontinuity is present. Discontinuities are hence called “projectivity violations” – see Mel'čuk (1988: 35ff.), Heringer (1996: 243ff.), and Eroms (2000: 311ff.).

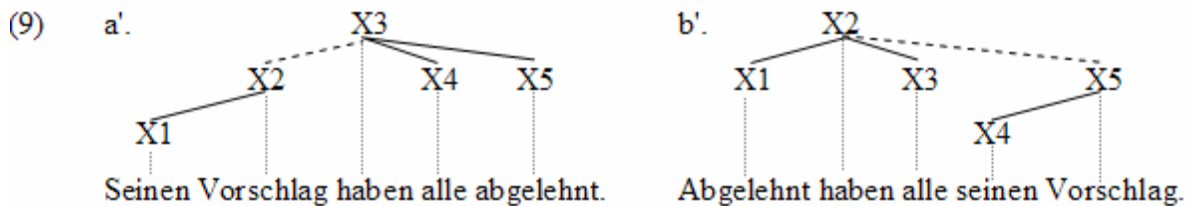


The position of *seinen Vorschlag* in each case with respect to its governor *abgelehnt* results in crossing lines, i.e. the dependency edge connecting *seinen Vorschlag* to *abgelehnt* crosses two projection lines. Thus the structures (9a–b) each contain a projectivity violation.

Addressing such discontinuities is of course a major goal of dependency grammar. In this respect though, it is worth noting that dependency structures involve fewer discontinuities than the corresponding constituency structures. This is so because dependency structures are usually flatter than constituency structures – see Starosta (1988:106), Heringer (1996: 27f.), Hudson (2000: 22). For instance, compare tree (6a), four levels, with tree (6b), six levels. Despite the flatter structures, discontinuities of the sort illustrated in (9a–b) are a common occurrence in German. The V2 principle of German seems to allow more projectivity violations than the subject-verb principle of English.⁷

⁷ An anonymous reviewer raises the question whether dependency grammar acknowledges German as essentially a V-last language as many linguists assume. This

The strategy employed here to address projectivity violations was mentioned in the previous section. The assumption is that rising occurs, i.e. a dependent rises and attaches to a word above its governor.⁸ The result of rising is that the risen constituent's head is no longer its governor. Constituents that have risen are, as mentioned above, indicated via a dashed dependency edge. The rising approach hence assumes the following structures for (9a–b):



In each case, *seinen Vorschlag* rises in such a manner that the projectivity violation is overcome.

The 'rising' idea to be employed here has precedents in the dependency grammar literature: Bröker (2000) sees the relevant constituent "lifting", Duchier and Dubesmann (2001) choose the term "climbing", and Gerdes and Kahane (2001) opt for "emancipation". Although there are differences in the approaches of these linguists, the underlying idea is the same: to avoid a discontinuity (projectivity violation), a flattening of structure occurs. The discussion of nonfinite verb complexes below seeks to identify when rising is and is not possible. In so doing, the basics of a theory of discontinuities in dependency grammar are established.

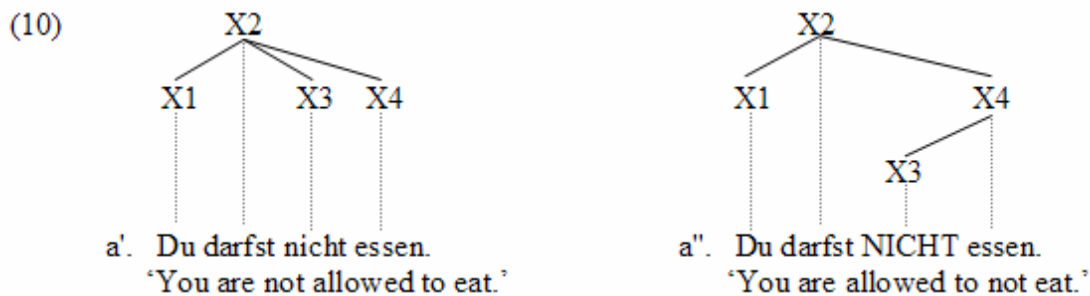
The concept of rising just introduced receives empirical support from at least two areas. The first is the behavior of negation. The following sentence is ambiguous:

issue is inapplicable to the current system, for the current approach is like most dependency grammars insofar as it is monostratal. Monostratal grammars do not entertain derivational concepts of verb movement. If one does nevertheless opt for a derivational dependency-based approach though, then verb movement is understood much differently than in constituency grammars. Since it is always the root of the matrix clause, the finite verb itself never moves alone, but rather its dependents move and shift around it.

⁸ The term 'rising' is used metaphorically. It does not necessitate that the current theory be understood as derivational. Stating that a constituent "rises" should be understood as synonymous with the statement that it "has exercised the option to attach to a node that dominates its governor".

- (10) a. Du darfst nicht essen.
 you may not eat

This sentence can mean either ‘You are not allowed to eat’ or ‘You are allowed to not eat’. The latter meaning requires the negation to be emphasized. Dependency grammar captures the ambiguity as follows:



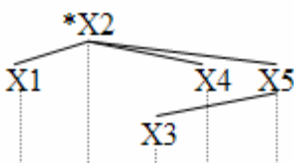
The negation *nicht* can attach to *darfst* as a post-dependent or to *essen* as a pre-dependent. Note that if topicalization of the infinitive occurs, the sentence is no longer ambiguous; only the first meaning obtains:

- (10) b. Essen darfst du nicht.
 ‘You are not allowed to eat.’


The ambiguity disappears because the negation no longer has the option to attach to the infinitival verb; it must attach to the finite verb. Next, consider what happens when an object is added:

- (11) a. Du darfst das nicht essen.
 you may that not eat
 ‘You are not allowed to eat that.’ or ‘You are allowed to not eat that.’
- b. Das essen darfst du nicht.
 ‘You are not allowed to eat that.’

Now the argument in favor of rising is seen in the ambiguity of (11a). On the first reading of (11a), the object must have risen. If it were not capable of rising, one would expect only the second reading to be available because *nicht* would be prevented from attaching to *darfst* by the dependency connecting *das* to *essen*.

- (11)  - Star indicates unacceptable structure.
- a'. Du darfst das nicht essen.
'You are not allowed to eat that.'

Since the first reading is not only possible but actually the preferred reading, we have proof that *das* can rise.

- (11) 
- a". Du darfst das nicht essen.
'You are not allowed to eat that.'
- a'''. Du darfst das nicht essen.⁹
'You are allowed to not eat that.'

The second type of evidence supporting the rising approach occurs with instances of the long passive. A widely acknowledged fact about certain verbs is that a curious case alternation can obtain – see Stechow (1990: 189ff.), S. Müller (2002: 94), Haider (2003). The following data is from Haider (2003: 97):

- (12) a. dass DEN Wagen zu reparieren versucht wurde - Accusative case
that the car to repair tried was
'that one tried to fix the car'
- b. dass DER Wagen zu reparieren versucht wurde - Nominative case
- (13) a. dass uns DEN Erfolg auszukosten erlaubt wurde - Accusative case
that us the success to.enjoy allowed was
'that we were allowed to enjoy our success'
- b. dass uns DER Erfolg auszukosten erlaubt wurde - Nominative case

In these examples, both nominative and accusative case is possible. At other times however, only the accusative is possible:

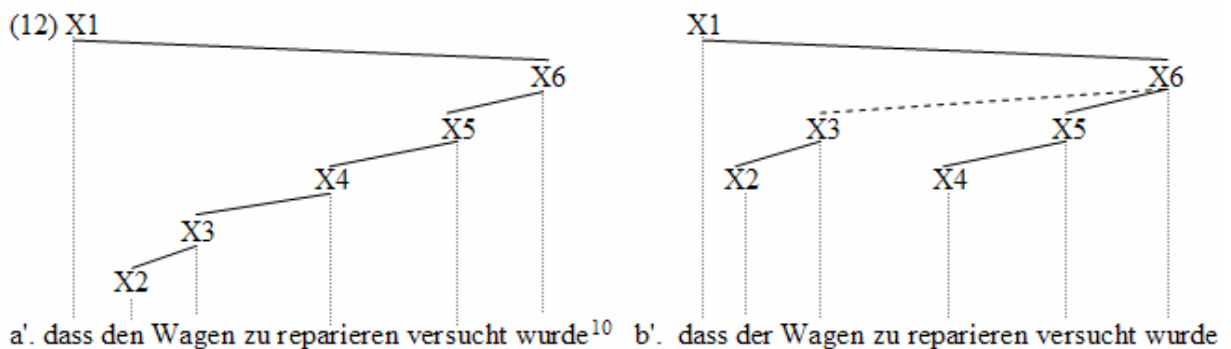
⁹ There is a third analysis of (11) that is also valid. It has *das* rising to attach to *darfst* and *nicht* as a dependent of *essen*. This analysis would mean the same thing as (11a''').

- (12) c. Es wurde versucht, den / *der Wagen zu reparieren.
 It was tried the the car to repair
 ‘One tried to repair the car.’
- (13) c. Uns wurde erlaubt, den/*der Erfolg auszukosten.
 us was allowed the the success to.enjoy
 ‘We were allowed to enjoy our success.’

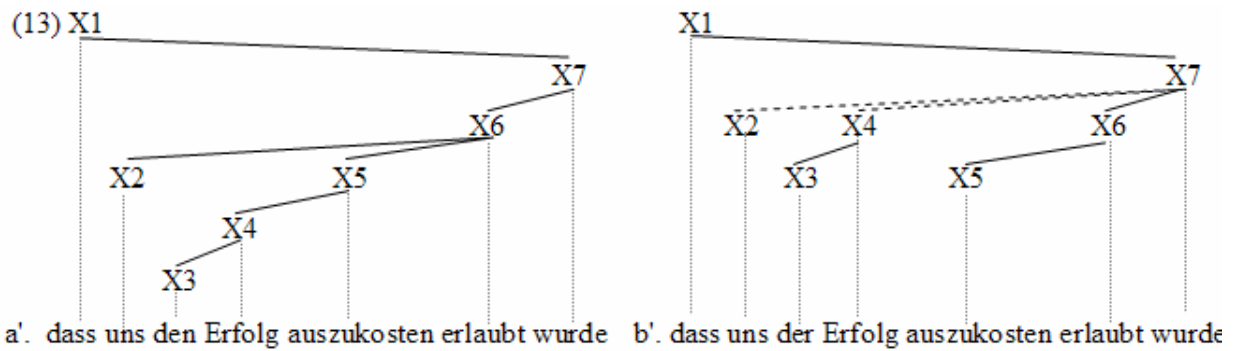
And yet at other times, only the nominative is possible:

- (12) d. Zu reparieren versucht wurde *den/derWagen nicht. (Haider 2003:97)
 to repair tried was the the car not
 ‘One did not try to have the car repaired.’
- (13) d. Auszukosten erlaubt wurde *den/derErfolg nicht. (Haider 2003:97)
 to.enjoy allowed was the the success not
 ‘It was not allowed to enjoy one’s success.’

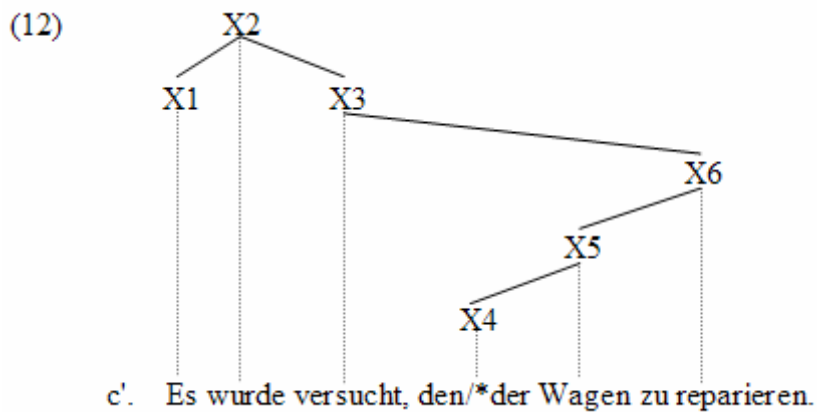
The possibility of rising helps explain these data. The position of the NPs in (12a–b, 13a–b) allows for optional rising. When rising is absent, the accusative is necessary; when it is present, the nominative obtains:



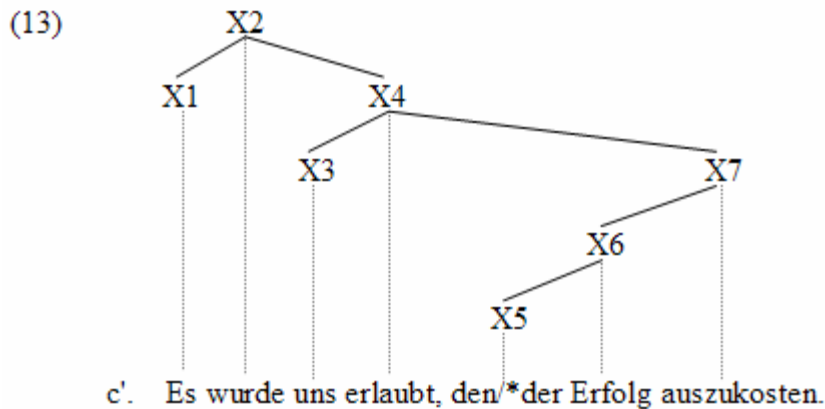
¹⁰ Since *zu* and its infinitive behave as a single word in every way in German, unlike in English, the two are granted just a single node throughout the trees in this paper.



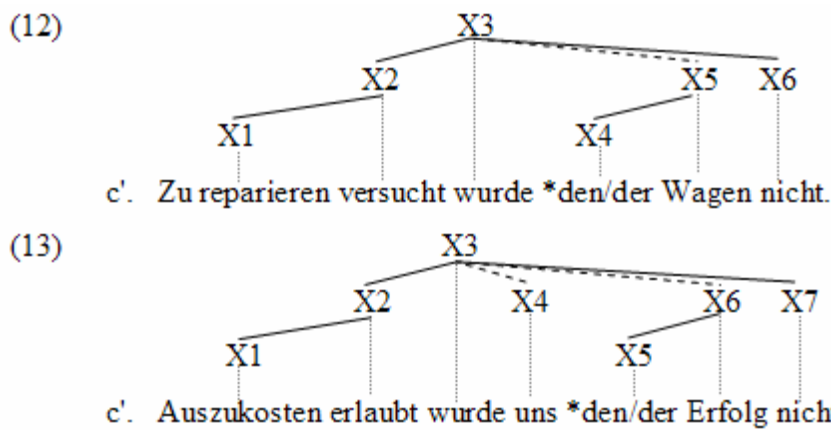
When rising is not a possibility due to the position of the infinitival phrase, the accusative is obligatory:¹¹



¹¹ A rising analysis of (12c) and (13c) is actually conceivable: both the object NP and the *zu*-infinitive would attach as post-dependents to the finite verb. The Predicate Weight Principle, however, which is presented in section 5.2, prevents this analysis. The -s object NP would be illicitly following the +s past participle as a co-sister.



And when only an analysis is possible where rising has occurred, the nominative is obligatory:



If one were to adopt a dependency grammar approach that rejected rising and in its place allowed projectivity violations, these data would be difficult to explain. The concept of rising just established is what makes the dependency grammar theory of coherence presented below possible.

3.3 Predicate chains

The three-way distinction between coherent, incoherent, and pseudoincoherent constituents mentioned in the introduction shall be grounded on the ‘predicate’ concept.

The term *predicate* has various meanings depending on the context. In the semantic sense, i.e. in Predicate Calculus, the predicate is the central relational meaning of an utterance that relates the arguments of that utterance to each other. In the syntactic sense, in contrast, there are

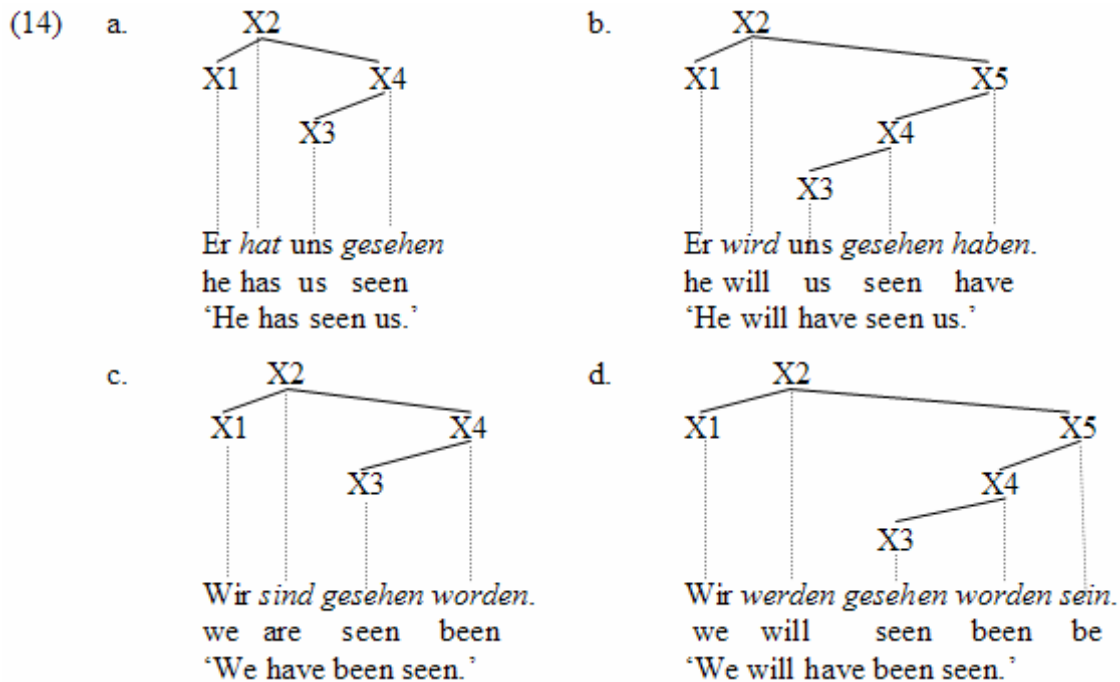
basically two distinct meanings of the term. The first sees the predicate as that which is predicated of the subject. This understanding of the concept stems from antiquity and is prominent in traditional grammars. It has everything that is not the subject of a sentence qualifying as the predicate of that sentence. Most modern constituency grammars have this binary division at their cores. In Transformational Grammar for instance, the binarity is seen in the first rewrite rule of the base, i.e. $S \rightarrow NP VP$. The other meaning takes those words in the syntax of an utterance as the predicate that correspond to the central relational meaning in the semantics of that sentence. This second meaning tends to acknowledge a three-way distinction: predicates, arguments, and adjuncts.

It is interesting to note that the former meaning of the term *predicate*, i.e. in terms of binarity, dominates in grammars of the English language. Trask (1997: 174), for instance, provides only this definition of *predicate* in his dictionary of linguistics terminology. Even Quirk, Greenbaum, Leech, and Svartvik's (1985: 79, 1118, 1398) and Huddleston and Pullum's (2002: 25, 44, 50) comprehensive grammars of the English language prefer this understanding of the concept. In grammars of the German language in contrast, the second meaning – i.e. in terms of predicates, arguments, and adjuncts – is more prominent, e.g. Engel (1982:124ff.), Lühr (1993: 97ff.), Duden (1995: 605ff.), ZHS (1997: 659ff.), Hentschel and Weydt (2003: 338ff.). In view of the differences in the syntax of English and German, it is perhaps not surprising that the grammars of English prefer the former meaning, and that those of the German language prefer the latter. English as a strict subject-verb language lends itself to analyses in terms of binary divisions, whereas German as a V2 language is less accessible using such approaches.

This paper adopts the second understanding of 'predicate.' The predicate of a sentence is taken to be the word(s) that correspond(s) to the central relational meaning in the semantics of that sentence. This understanding is currently prominent in the LFG and HPSG frameworks, e.g. Kathol (1998, 2000), Ackerman and Webelhuth (1998), Webelhuth and Ackerman (1999), Müller (2002). Grimshaw's (1991) 'extended projection' concept is the same basic idea – see Schmid and Vogel (2004: fn. 7). Analytic verb complexes are a good orientation point in this regard. The main and auxiliary verbs of an analytic verb complex in one language that correspond to a synthetic verb form in another language qualify together as the predicate, e.g. *hat...gesehen* 'has seen', *wird...gesehen haben* 'will have

seen', *ist gesehen worden* 'has been seen', *wird gesehen worden sein* 'will have been seen', etc.

In dependency grammar, the verbs of an analytic verb complex always form a *chain* – see O'Grady (1998) and Osborne (2005a). A chain is a *word combination that is continuous on the vertical axis*.



The words of the predicates are in italics. Each of these predicates is a chain because it is top-down continuous. For instance, *werden* in (14d) immediately dominates *sein*, *sein* immediately dominates *worden*, and *worden* immediately dominates *gesehen*. Note that *hat* and *gesehen* in (14a) and *wird* and *gesehen haben* in (14b) are not left-to-right continuous, i.e. they are discontinuous on the horizontal axis because *uns* in each case intervenes. The fact that the words of predicates are always continuous on the vertical axis is important. It means that the analysis of predicates can refer to the relative position of a predicate element within the predicate chain. The importance of this point will become evident in sections 5.1 and 5.2, where the Scrambling Principle and the Predicate Serialization Principle are presented.

3.4 Coherence defined in dependency grammar

The discussion has now reached the point where the specific terminology to be employed for the dependency grammar analysis of coherence can be presented. The three-way distinction mentioned in the introduction is expressed here in terms of words.

Coherent word: a word that is part of the matrix predicate chain.

Incoherent word: a word that is not part of the matrix predicate chain.

Pseudoincoherent word: a word that is not actually part of the matrix predicate chain but that behaves as if it were in certain ways.

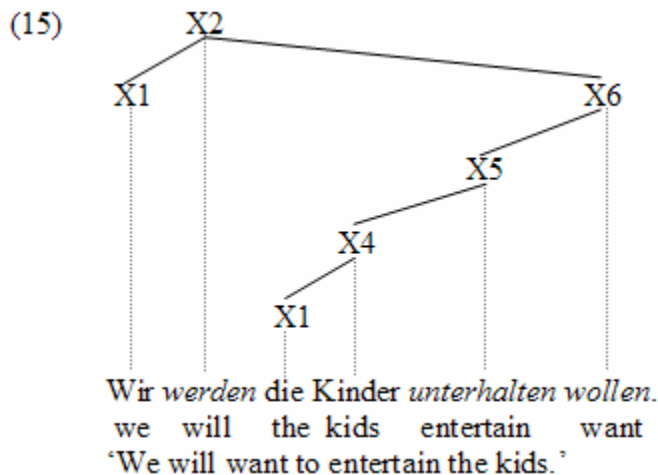
And given these definitions, the following definitions are straightforward:

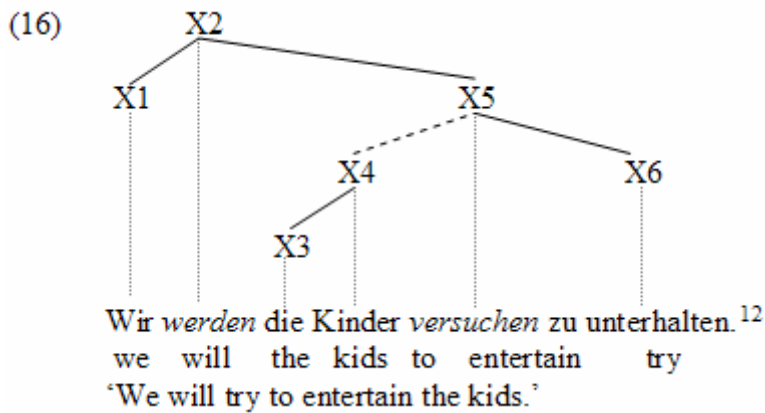
Coherent constituent: A constituent the root of which is part of the matrix predicate chain.

Incoherent constituent: A constituent the root of which is not part of the matrix predicate chain.

Pseudoincoherent constituent: A constituent the root of which is not actually part of the matrix predicate chain but that behaves as if it were in certain ways.

These definitions shall be illustrated with the help of the following trees. The predicate chains are in italics.





According to the definitions, *die Kinder unterhalten* and *die Kinder unterhalten wollen* are coherent constituents in (15). *Wir*, *die*, and *die Kinder* are incoherent constituents in (15). In (16), *die Kinder versuchen zu unterhalten* is a coherent constituent, and *wir*, *die*, and *die Kinder* are again incoherent constituents. The interesting constituent in (16) is *zu unterhalten*; it is pseudoincoherent. This point will become clear as the discussion continues.

There are numerous types of coherent constituents. Their roots are bare infinitives, *zu*-infinitives, non-adjectival participles, and predicative elements of various sorts. Concerning coherent and pseudoincoherent constituents, the discussion below focuses on *zu*-infinitives in accordance with Bech's analysis of nonfinite verb complexes. *Zu*-infinitives can, namely, be the roots of coherent, incoherent, and pseudoincoherent constituents. The following verbs among others subcategorize for coherent *zu*-infinitives:

bekommen 'receive', bleiben 'stay', nicht brauchen 'not need', drohen 'threaten',
 gedenken 'think of', haben 'have', sein 'be', versprechen 'promise', wissen
 'know'¹³

¹² An alternative analysis of (16) has *die Kinder* rising to attach to *werden*, not to *versuchen*. Sentence (i) demonstrates that the analysis shown is plausible, and (ii) shows that the alternative analysis is also plausible:

- (i) Die Kinder versuchen zu unterhalten werden wir (schon).
- (ii) Versuchen zu unterhalten werden wir die Kinder.

¹³ According to Prinzhorn (1990: 200), the type of dependents that *drohen* and *versprechen* take depends on the subject. With non-agent subjects, these verbs take coherent constituents. With agent subjects, they take (pseudo)incoherent constituents.

The following list is a sample of the verbs that subcategorize for incoherent *zu*-infinitives:

andeuten 'indicate', anflehen 'beseech', anspornen 'spur', antreiben 'encourage', anweisen 'instruct', auffordern 'ask', beauftragen 'commission', bedauern 'regret', befähigen 'empower', begehren 'desire', beneiden 'envy', bereuen 'regret', bestechen 'bribe', bewegen 'move', bitten 'ask', drängen 'press', einladen 'invite', erinnern 'remember', ermutigen 'embolden', ersuchen 'request', fortfahren 'continue', hindern 'hinder', locken 'lure', motivieren 'motivate', nötigen 'compel', überreden 'convince', überzeugen 'convince', veranlassen 'arrange', verführen 'lead astray', verhindern 'prevent', verlangen 'demand', verleiten 'lead astray', verlocken 'entice', verpflichten 'oblige', vorschlagen 'suggest', verzichten 'do without', zurückhalten 'hold back', zögern 'hesitate', zwingen 'force'

And the following list is a sample of the verbs that subcategorize for incoherent constituents, but that allow these constituents to be pseudoincoherent.

anfangen 'start', beabsichtigen 'intend', beginnen 'begin', beschließen 'decide', drohen 'threaten', erlauben 'allow', erwägen 'consider', fürchten 'fear', gestatten 'allow', hoffen 'hope', lernen 'learn', lieben 'love', meinen 'think', planen 'plan', streben 'strive', überlassen 'let have', vergessen 'forget', vermögen 'can', verstehen 'understand', versprechen 'promise', versuchen 'try', vorhaben 'plan', wagen 'dare', wännen 'think', wünschen 'wish'

These groupings have been compiled based on the examples appearing in the literature – see Stechow (1984), Grewendorf (1988: Ch. 12), Prinzhorn (1990: 202), Grewendorf and Sabel (1994), Hinrichs and Nakazawa (1998: 125), ZHS (1998: 2198), Meurers (1999), Sabel (1999: 420), De Kuthy and Meurers (2001), Wöllstein-Leisten (2001: 58).

There are some widely acknowledged tendencies concerning the syntax and semantics of these groupings. Subject control verbs can take pseudoincoherent *zu*-infinitives, whereas object control verbs tend to take incoherent *zu*-infinitives. At times there is disagreement about the classification of a given verb and grammaticality judgments vary – in this area, see the comments of Fanselow (1989: n. 6) and Hinrichs and Nakazawa (1994: 13, 1998: 125). The difficulties in classifying many verbs suggest the distinction is probably gradient.¹⁴

¹⁴ A good example of the difficulty to classify various verbs is seen in De Kuthy and Meurers (2001: 155, 158f.) and Hinrichs and Nakazawa (1998: 125). The former

Syntactic factors also influence the type of infinitival dependent that a verb subcategorizes for. Hinrichs and Nakazawa (1998: 125) and Sabel (1999: 422f.) note that accusative object control verbs necessarily subcategorize for incoherent *zu*-infinitives. In addition, Kvam (1982: 340) and Wöllstein-Leisten (2001: 60) observe that the appearance of a correlative element with the matrix verb also forces incoherence.

(17) a. Sie hat uns verpflichtet, unsere Sachen zu organisieren.
 She has us required our things to organize
 ‘She required us to organize our things.’

b. *Sie hat uns unsere Sachen verpflichtet zu organisieren.

(18) a. Sie wird es vergessen, mich anzurufen.
 She will it forget me to.call
 ‘She will forget to call me.’

b. Sie wird mich vergessen anzurufen.

c. *Sie wird es mich vergessen anzurufen.

The analysis of examples such as these will become clear below. For now one should note that the appearance of an accusative object or correlative element with the matrix verb prevents the third construction. These syntactic factors influencing coherence can be utilized to reduce the difficulties associated with varying grammaticality judgments. Accordingly, this paper sticks mainly to accusative object control verbs to demonstrate incoherence.

Finally, note that the definitions above are not limited in application to infinitival verbs. This means that all constituents – be their roots verbs, nouns, prepositions, adverbs, etc. – can be classified in terms of coherence. This point is important because it enables the notion of coherence to be extended to all words and constituents, regardless of their syntactic category. Indeed, section 6 demonstrates that the theory of coherence can shed light on the behavior of certain discontinuous noun phrases.

produce more than one example illustrating that *empfehlen* constructs incoherently, whereas the latter list *empfehlen* as a verb that allows the third construction.

4. Diagnostics for coherence

The validity of the three-way distinction – coherent vs. incoherent vs. pseudoincoherent constituent – is established in the following sections. Nine diagnostics are used:

1. Extraposition
2. Intraposition
3. Bare infinitive fronting
4. Infinitival fronting
5. Scrambling
6. Pied-piping
7. Position of negation
8. Scope of negation
9. Gapping

Coherent constituents behave much differently than incoherent constituents, whereas pseudoincoherent constituents demonstrate traits of both coherent and incoherent constituents simultaneously.

4.1 Extraposition

Perhaps the easiest and most widely employed test for coherence is extraposition, e.g. Bech (1955: 84), Kvam (1982: 337ff.), Askedal (1983: 182), Fanselow (1989: 3f.), Prinzhorn (2000: 201), Stechow (1990: 148), Reape (1994: 166ff.), Kiss (1995: 30), Meurers (1999: 20), Müller (2002: 42f.). If an infinitival phrase can appear to the right of its governor, then a (pseudo)incoherent constituent is present. In the examples here and further below, the relevant constituent is italicized and its status is given on the right. When the object NP of the *zu*-infinitive is not italicized with its governor, it means that object NP has risen.

- (19) a. *weil niemand hat *ein Lied gesungen* - Coherent
 because no.one has a song sung
 ‘because no one sang a song’
- b. weil niemand ein Lied versuchte, *zu singen* - Pseudoincoherent
 because no.one a song tried to sing
 ‘because no one tried to sing a song’
- c. weil niemand mich zwang, *ein Lied zu singen* - Incoherent
 because no.one me forced a song to sing

Coherent constituents cannot be extraposed. Thus *ein Lied gesungen* in (19a) is a coherent constituent. Incoherent constituents can, in contrast, be extraposed. Hence the constituents *ein Lied zu singen* in (19c) is an incoherent constituent. Example (19b) has *zu singen* as a pseudoincoherent constituent: the *zu*-infinitive itself is extraposed, but its object has risen to appear in the Mittelfeld.

4.2 Intraposition

A less widely employed, but quite convenient, test for coherence is intraposition, e.g. Fanselow (1989: 3), G. Müller (1998: 24), De Kuthy and Meurers (2001: 155f.). If a constituent can be separated from its governor in the Mittelfeld, then it is incoherent.

- (20) a. *weil *das Lied gesungen* niemand hat - Coherent
 because the song sung no.one has
 ‘because no one sang the song’
- b. weil *das Lied zu singen* niemand versuchte¹⁵ - Incoherent
 because the song to sing no.one tried
 ‘because no one tried to sing the song’
- c. weil *das Lied zu singen* niemand mich zwang¹⁶ - Incoherent
 because the song to sing no.one me forced
 ‘because no one forced me to sing the song’

The governor of the italicized constituent in each case is the finite verb. Since the subject intervenes between the two, intraposition obtains. Coherent constituents may not be separated from their governors in this manner, as illustrated in (20a).

¹⁵ Similar examples from the literature:

- (i) dass das Buch zu lesen keiner versucht hat (G. Müller 1998: 24)
 (ii) Er wird das Pferd zu verkaufen noch heute versuchen.
 (De Kuthy & Meurers 2001)

¹⁶ Similar example from the literature:

- (i) Er wird das Pferd zu verkaufen ihr noch heute empfehlen.
 (De Kuthy & Meurers 2001)

4.3 Bare infinitive fronting

A widely observed, but poorly understood, trait of predicate chains is that an intermediate link of a predicate chain may not be fronted alone. These intermediate links are usually bare infinitives, hence the term *bare infinitive fronting*. This peculiarity of predicate chains is sometimes used as a test for coherence, e.g. Kiss (1995: 31), De Kuthy and Meurers (2001), Müller (2002: 44).

- (21) a. *Wollen wird niemand *das Lied singen*¹⁷ - Coherent
 b. Versuchen wird niemand *das Lied zu singen*¹⁸ - Incoherent/pseudoincoherent¹⁹
 c. Zwingen wird niemand mich *das Lied zu singen* - Incoherent

Data like (21a) occur frequently in the literature, e.g. Engel (1982: 225), Olszok (1983: 109), Fanselow (1987: 93), Grewendorf (1988: 300f.), Nerbonne (1994: 118, 136ff.), ZHS (1997: 1623ff), Bouma and Van Nord (1998: 62f.), Kathol (1998: 230f., 2000: 205), Meurers (1999: 245), Webelhuth and Ackerman (1999). The ungrammaticality of (21a) obtains because *wollen* is an intermediate link in the predicate chain *wird-wollen-singen*. *Versuchen* in (21b) and *zwingen* in (21c), in contrast, are not intermediate links in their respective predicate chains, but rather they are the terminal links; they can hence be fronted alone. This situation demonstrates that *das Lied zu singen* in (21b) and in (21c) are (pseudo)incoherent constituents. Section 5.2 has more to say about this aspect of predicate chains.

4.4 Infinitival verb fronting

A test similar to bare infinitive fronting is *infinitival fronting*. An infinitival verb that subcategorizes for an object complement may not be fronted alone without its complement if it is the root of an incoherent constituent.

¹⁷ Similar example from the literature:

(i) *Gewesen ist er auf seine Kinder stolz. (De Kuthy & Meurers 2001)

¹⁸ Similar examples from the literature:

(i) Zwar vermochten mich seine Ergebnisse nicht zu befriedigen. (Kiss 1995: 27)

(ii) Versuchen wird er, das Pferd zu verkaufen. (S. Müller 2002: 44)

¹⁹ The example allows two analyses, i.e. one in terms of incoherence where the object NP has not risen and one in terms of pseudoincoherence where the object NP has risen.

Fanselow (1989: 4), Grewendorf and Sabel (1994: 265), Kiss (1994: 96), G. Müller (1998: 18) and De Kuthy and Meurers (2001) use this aspect of infinitival verb phrases as a test for coherence.

- (22) a. *Gesungen* hat niemand das Lied. - Coherent
 b. *Zu singen* hat niemand das Lied versucht.²⁰ - Pseudoincoherent
 c. **Zu singen* hat niemand mich das Lied gezwungen.²¹ - Incoherent

Das Lied in each case is the complement of the fronted infinitival verb. When this fronted verb is incoherent, ungrammaticality obtains.

4.5 Pied-piping

Pied-piping in relative clauses is a widely employed diagnostic for coherence, e.g. Bech (1955: 79), Kvam (1982: 338, 350), Askedal (1983: 182f.), Grewendorf (1988: 271), Stechow (1990: 148), Grewendorf and Sabel (1994: 275f.), Kiss (1994: 71, 1995: 30f.), Hinrichs and Nakazawa (1998: 120f.), ZHS (1998: 2191), Meurers (1999: 21), Müller (2002: 42, 70). If the relative pronoun can pied-pipe its governor, an incoherent constituent is present:

- (23) a. *das Lied, *das gesungen* niemand hat - Coherent
 the song that sung no.one has
 ‘the song that no one sang’
 b. das Lied, *das zu singen* niemand versucht hat - Incoherent
 the song that to sing no.one tried has
 ‘the song that no one tried to sing’
 c. das Lied, *das zu singen* niemand mich gezwungen hat - Incoherent
 the song that to sing no.one me forced has
 ‘the song that no one forced me to sing’

²⁰ Similar examples from the literature:

- (i) *Zu füttern versucht hat den Hund keiner.* (Grewendorf & Sabel 1994: 265)
 (ii) *Zu verkaufen versuchte er das Pferd.* (De Kuthy & Meurers 2001)

²¹ Similar examples from the literature:

- (i) **Zu stören aufgefordert hat Max mich ihn.* (Fanselow 1989: 4)
 (ii) **Zu füttern geögert hat den Hund keiner.* (Grewendorf & Sabel 1994: 265)
 (iii) **Zu lesen hat das Buch keiner abgelehnt.* (G. Müller 1998: 18)

The ungrammaticality in (23a) obtains because the relative pronoun may not pied-pipe its governor if that governor is coherent. If that governor is incoherent though, as in (23b–c), then pied-piping is fine.

4.6 Scrambling

Scrambling is also commonly used to identify coherence, Bech (1955: 61f., 74f.), Fanselow (1989: 3), Prinzhorn (2000: 203), Grewendorf and Sabel (1994: 264f.), Reape (1994: 171ff.), ZHS (1998: 2192), Meurers (1999: 21), De Kuthy and Meurers (2001: 154f.), Wöllstein-Leisten (2001:12), Müller (2002: 40f.).

- (24) a. weil das Lied niemand *gesungen* hat - Coherent
 b. weil das Lied niemand *zu singen* versucht hat²² - Pseudoincoherent
 c. *weil das Lied niemand mich *zu singen* gezwungen hat²³ - Incoherent

The object complement of an incoherent infinitival verb may not be scrambled out from under that infinitival verb, as illustrated in (24c). When the infinitival verb is coherent or pseudoincoherent however, as in (24a) and (24b), the result is fine.

4.7 Position of negation

The position of the negation in a sentence can be used as a diagnostic for coherence, e.g. S. Müller (2002: 41f.). The negation may not split left-branching predicate chains.

- (25) a. *weil Thomas *das Lied gesungen* nicht hat - Coherent
 because Thomas the song sung not has
 ‘because Thomas has not sung the song’

²² Similar examples from the literature:

- (i) dass das Buch keiner zu lesen versucht hat (G. Müller 1998: 17)
 (ii) dass das Pferd keiner zu verkaufen versucht hat (De Kuthy & Meurers 2001)
 (iii) weil es ihm jemand zu lesen versprochen hat (S. Müller 2002: 40)

²³ Similar examples from the literature:

- (i) ?*dass das Buch keiner zu lesen abgelehnt hat (G. Müller 1998: 17)
 (ii) *Noch heute wird es der Mann zu verkaufen empfehlen.
 (De Kuthy & Meurers 2001)

- b. weil Thomas *das Lied zu singen* nicht versucht hat - Incoherent
 because Thomas the song to sing not tried has
 ‘because Thomas did not try to sing the song’
- c. weil Thomas mich *das Lied zu singen* nicht gezwungen hat - Incoherent
 because Thomas me the song to sing not forced has
 ‘because Thomas did not force me to sing the song’

Nicht in (25a) separates *gesungen* from *hat*; this situation results in ungrammaticality because *gesungen* and *hat* are links of a single predicate chain. Based on this observation, *zu singen* in (24b) and in (25c) is not part of the matrix predicate chains and is hence incoherent.

4.8 Scope of negation and cohesion

A similar test for coherence using negation places the negation immediately in front of all the verbs – see Kiss (1994: 74f.), S. Müller (2002: 40). If the matrix main verb cannot be negated in doing so, then one has incoherence.

- (26) a. weil Thomas das Lied nicht *gesungen* hat - Coherent
- b. weil Thomas das Lied nicht *zu singen* versucht hat - Pseudoincoherent
- c. (*)weil Thomas mich *das Lied nicht zu singen* gezwungen hat - Incoherent

Sentence (26b) is actually ambiguous, although the reading indicated by the italics has the matrix verb *versucht*, not the embedded verb *zu singen*, being negated. Sentence (26c) is allowed on the reading where *zu singen* is negated. On the other reading however, i.e. where *gezwungen* is negated, it is disallowed.

The scope of cohesion is the same test. Cohesion obtains when a negation and an indefinite expression combine into a single word, e.g. *nicht ein* = *kein*, *nicht jemand* = *niemand*, *nicht etwas* = *nichts*, etc. Cohesion is a widely employed diagnostic for coherence, e.g. Grewendorf (1988: 270f.), Fanselow (1989: 4), Stechow (1990: 147).

- (27) a. weil Thomas *kein Lied gesungen* hat - Coherent
 because Thomas no song sung has
 ‘because Thomas did not sing a song’

- b. weil Thomas kein Lied *zu singen* versucht hat - Pseudoincoherent
 because Thomas no song to sing tried has
 ‘because Thomas did not try to sing a song’
- c. (*)weil Thomas mich *kein Lied zu singen* gezwungen hat - Incoherent
 because Thomas me no song to sing forced has
 ‘because Thomas did not force me to sing a song’

The same result obtains in (27) as in (26). *Kein* negates the matrix verb *gesungen* in (27a). On the reading indicated by the italics, *kein* negates the matrix verb *versucht* in (27b). In (27c) however, *kein* cannot negate the matrix verb *gezwungen*, but rather it is limited to negating the embedded verb *zu singen*.

4.9 Gapping

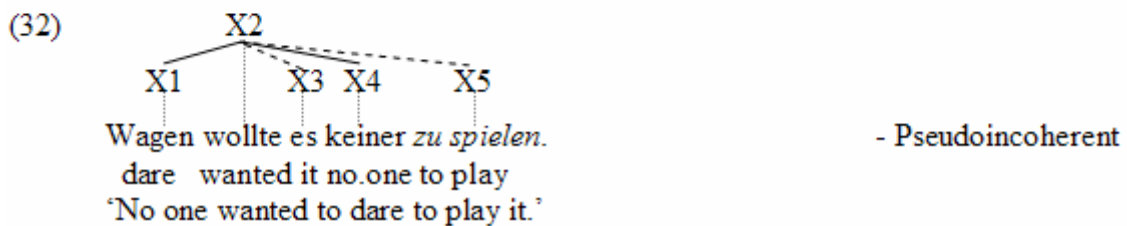
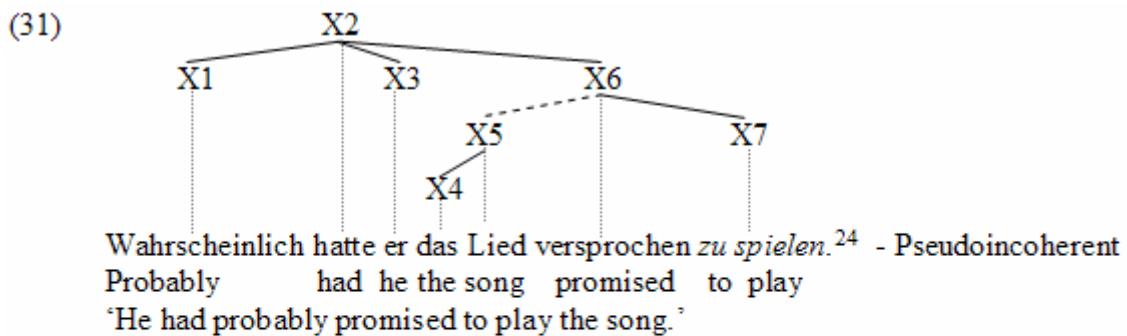
A test for coherence that I have not encountered in the literature is gapping. The gap of a gapped conjunct may not ‘cut into’ an incoherent constituent. It may, however, cut into a (pseudoin)coherent constituent:

- (28) a. weil sie *ihn besucht* hat, und er sie. - Coherent
 because she him visited has and he her
 ‘because she visited him, and he her’
- b. weil sie ihn *zu besuchen* versucht hat, und er sie.-Pseudoincoherent
 because she him to visit tried has and he her
 ‘because she tried to visit him, and him her’
- c. *weil sie *ihn zu besuchen* vorgeschlagen hat, und er sie.- Incoherent
 because she him to visit suggested has and him her
 ‘because she suggested to visit him, and him her’

The relevant constituents are in italics. When this constituent is coherent or pseudoincoherent, the embedded infinitival verb can be ‘gapped’, e.g. *besucht* in (28a) and *zu besuchen* in (28b). When that infinitival verb is the root of an incoherent constituent however, the embedded infinitival verb may not be gapped, e.g. *zu besuchen* in (28c).

4.10 Summary of diagnostics

To summarize the results of the diagnostics, the discussion takes a closer look at pseudoincoherent constituents. Pseudoincoherence obtains when the object of what would be an incoherent *zu*-infinitive under normal circumstances has risen. The following examples illustrate:



Sentence (31) illustrates the extraposition associated with incoherent constituents – *zu spielen* appears to the right of *versprochen* – as well as the scrambling associated with coherent constituents – *das Lied* is nonadjacent to its governor *zu spielen*. Sentence (32) shows the scrambling of coherent constituents – *es* is non-adjacent to its governor *zu spielen* – as well as the bare infinitive fronting possible of incoherent constituents – *wagen* is in the initial position without its dependent *es zu spielen*. In other words, each of the examples (31–32) displays the traits of a coherent and an incoherent constituent simultaneously. The term *pseudoincoherent constituent* is suited to capture this unique behavior.

²⁴ The tree shows *das Lied* as attaching to *versprochen*. An alternative analysis has it attaching to *hatte*. I have chosen the analysis shown due to the acceptability of *Das Lied versprochen zu spielen hatte er wahrscheinlich*. See footnote 12.

5. Two features

Two features are necessary to capture the three-way distinction: $\pm s$ (scrambling) and $\pm p$ (predicate). The feature $\pm s$ is analogous to the \pm_{LEX} feature employed in HPSG accounts, e.g. Hinrichs and Nakazawa (1994), Nerbonne (1994), Meurers (1999), De Kuthy and Meurers (2001). It is associated with the possibility of scrambling. A $+s$ word is transparent for the rising of scrambling, whereas a $-s$ word is a barrier to the rising of scrambling. “Transparent for rising” means that the dependents of that node have the option to rise. The feature $\pm p$ is associated with the ability of a constituent to be extraposed and to occur with bare infinitive fronting. A $+p$ word is subject to more positional restrictions than a $-p$ word.

An overview of these features is as follows:

coherent word	+s	+p
pseudoincoherent word	+s	-p
incoherent word	-s	-p ²⁵

Coherent words have the feature combination $+s +p$, which means they are transparent for the rising of scrambling and adhere to strict positional restrictions. Incoherent words are $-s -p$, which means they are barriers to the rising of scrambling and do not adhere to strict positional restrictions.

²⁵ Notice that the feature combination $-s +p$ is not included in the table. I believe that this combination is actually manifest on certain words, for instance on some prepositions and predicate nouns. Unlike English, German disallows preposition stranding. This fact is witness to the inherent trait of prepositions as $-s$ words in German. Thus if a preposition is included in the predicate, it will have the feature values $-s +p$. The preposition of a predicate PP illustrates:

- (i) a. Alles soll unter dem Bett sein.
 everything should under the bed be
 ‘Everything should be under the bed.’
- b. *Unter soll das dem Bett sein. - Fronting/scrambling
- b. *Alles soll sein unter dem Bett. - Extraposition
- c. *weil unter dem Bett alles sein soll - Intraposition
- e. *weil dem Bett alles unter sein soll - Scrambling
- f. das Bett, unter dem alles sein soll - Pied-piping (obligatory)
- g. *Alles soll unter dem Bett nicht sein. - Position of negation

These data are just as they should be if *unter* is $-s +p$. The non-possibility of scrambling is consistent with $-s$. The non-possibility of fronting, extraposition, and intraposition, and the necessity of pied-piping as well as the position of negation are all consistent with $+p$.

Since pseudoincoherent words demonstrate the traits of both other types of words, they have the combination +s -p.

The distribution of these features is determined in part by generalizations across broad syntactic categories. The rule of coherence – see Bech (1955: 68) and Stechow (1990: 150) – states that first and third status supina, i.e. bare infinitives and predicate participles, necessarily construct coherently. In the current system, this means they have the feature combination +s +p. The features of second status supina however, i.e. complement *zu*-infinitives, are, in contrast, in part determined by the subcategorization traits of their governors.²⁶ Most of these governors subcategorize for a -s -p *zu*-infinitive, e.g. *ablehnen* ‘reject’, *auffordern* ‘encourage’, *zwingen* ‘force’. Some, however, subcategorize for +s +p *zu*-infinitives, e.g. *nicht brauchen* ‘not need’, *sein* ‘be’, *wissen* ‘know’. And some – e.g. *beginnen* ‘begin’, *versuchen* ‘try’, *wagen* ‘dare’ – have the option to subcategorize for -s -p or +s -p *zu*-infinitives. The following sections examine these features. The feature ±s is behind the Scrambling Principle, and the feature ±p is behind the Predicate Serialization Principle. Both features are behind the Predicate Weight Principle.

5.1 The Scrambling Principle

The ability of a constituent to take part in scrambling is expressed as the Scrambling Principle:

Scrambling Principle: If a word has the feature +s, then its dependents can rise to non-fronting (as well as fronting) positions.

An important thing to acknowledge about the +s feature is that in many instances the dependents of a +s word have the option to rise. In other instances however, rising is forced due to the need to overcome a

²⁶ Note that subject and adjunct *zu*-infinitives never allow scrambling – see Askedal (1983):

- (i) a. Die Zeitung zu lesen verlangt viel Zeit.
the newspaper to read demands much time
‘Reading the newspaper requires much time.’
- b. *Zu lesen verlangt die Zeitung viel Zeit.
- (ii) a. Er wird kommen, uns zu helfen.
he will come us to help
‘He will come help us.’
- b. *Er wird uns kommen zu helfen.

projectivity violation. When the rising and non-rising analyses are both possible, more than one structure is possible. Sentence (33) is such a case; the analysis shown here is the non-rising one:

- (33)
-
- Karsten hat mich nach Japan geflogen.
 Karsten has me to Japan flown.
 'Karsten flew me to Japan.'
- a. Nach Japan hat *mich* Karsten geflogen.
 b. ??Mich geflogen hat Karsten *nach Japan*.²⁷
 c. Nach Japan geflogen hat Karsten *mich*.
 d. Nach Japan geflogen hat *mich* Karsten.
 e. Geflogen hat Karsten *mich nach Japan*.
 f. Geflogen hat *mich* Karsten *nach Japan*.

Mich and *nach Japan* can be scrambled because *geflogen* is a +s category. In each of (33a–f), the position of *mich* and/or *nach Japan* with respect to its/their governor *geflogen* apparently qualifies as a discontinuity (projectivity violation). It is in such cases that the rising of scrambling is necessary, i.e. *mich* and/or *nach Japan* has/have taken on a node above its/their governor as its/their head.

²⁷ The unacceptability of (33b) is due to the relative 'weight' of the dependents involved. A heavier dependent cannot rise if its lighter sister dependent does not also rise. In the case of (33b), the heavier *nach Japan* cannot rise if the lighter *mich* does not also rise. The V2 principle, however, prevents *mich* from rising. This curious aspect of fronted nonfinite verbs has been noticed by others, e.g. Heidolph et al. (198: 721), Fanselow (1987: 94f.), Hinrichs and Nakazawa (1994: 94), Nerbonne (1994: 112f.), ZHS (1997: 1634), Eroms (2000: 368), Müller (2002: 95f.). More discussion on this further below.

- (33)
-
- a'. *Nach Japan hat mich Karsten geflogen.*
- b'. ??*Mich geflogen hat Karsten nach Japan.*
- c'. *Nach Japan geflogen hat Karsten mich.*
- d'. *Nach Japan geflogen hat mich Karsten.*
- e'. *Geflogen hat Karsten mich nach Japan.*
- f'. *Geflogen hat mich Karsten nach Japan.*

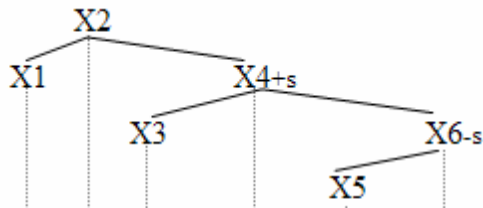
Given the understanding of rising expressed by the Scrambling Principle, the V2 principle of matrix declarative clauses is easily formulated. One assumes that a single dependent of the root word, and only a single dependent, is allowed to precede the root. In this manner, the V2 principle easily predicts the ungrammaticality of the following sentences among others:

- (33) g. **Nach Japan Karsten hat mich geflogen.*
 h. **Mich Karsten hat nach Japan geflogen.*
 i. **Geflogen Karsten hat mich nach Japan.*

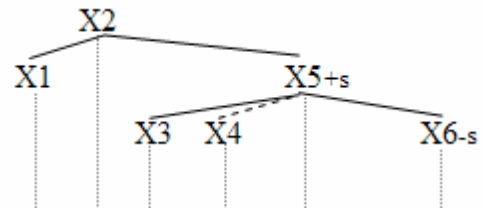
Since the subject is obligatorily a dependent of the finite verb, these sentences each have two pre-root dependents, a situation that V2 disallows.

Returning to the three-way distinction, incoherent words are barriers to the rising of scrambling. In the following examples, *gedrängt* itself is a +s category, but it assigns -s to *zu sagen*:

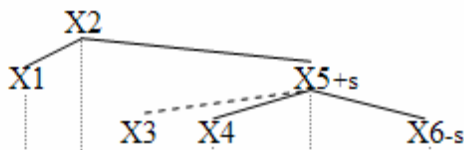
(34)



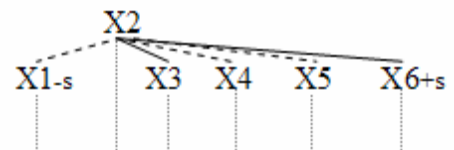
a. Man hat Tanja gedrängt, alles zu sagen.²⁸
 one has Tanja pressed all to say
 'One pressed Tanja to say everything.'



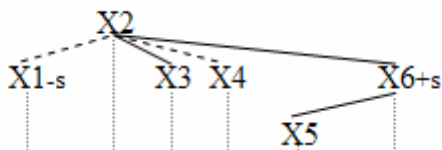
b. *Man hat Tanja alles gedrängt zu sagen.²⁹



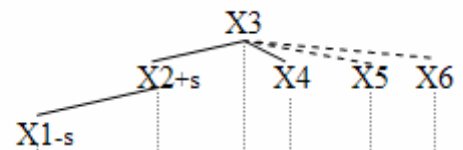
c. *Man hat alles Tanja gedrängt zu sagen.



d. *Zu sagen hat man Tanja alles gedrängt



e. *Zu sagen hat man alles Tanja gedrängt.



f. *Zu sagen gedrängt hat man Tanja alles.

Examples (34b–f) are each disallowed because *alles* has been scrambled, i.e. it has risen to a non-fronting position. Note that the rising of *Tanja* in (34d, f) is not the source of the ungrammaticality since *gedrängt* is a +s word.

Since pseudoincoherent words are +s like coherent words, they, unlike incoherent words, are transparent for scrambling. In the following examples, *versucht* is as a predicate participle a +s category that has the option to assign +s or -s to *zu lesen*. When rising has occurred, *versucht* has assigned +s to *zu lesen*:

²⁸ *Tanja* and *alles zu sagen* are both shown as dependents of *gedrängt*. Another possibility is that *Tanja* is viewed as rising to attach to *hat*. I have chosen the analysis due to the acceptability of *Tanja gedrängt alles zu sagen hat man schon*.

²⁹ *Tanja* and *alles* are both shown as dependents of *gedrängt*. Another possibility would be to have both as dependents of *hat*. Since either way *alles* must rise, the Scrambling Principle is violated on both analyses.

- (35)
-
- a. Nur einer hat versucht, den Brief zu lesen.
only one has tried the letter to read
'Only one person tried to read the letter.'
- b. Nur einer hat den Brief versucht zu lesen.³⁰
- c. Zu lesen hat nur einer den Brief versucht.
- d. Zu lesen versucht hat nur einer den Brief.

There is an aspect of weight that is essential for the analysis of scrambling. Example (36) appeared above as (33) – see footnote 27.

- (36)
-
- a. Karsten hat mich nach Japan geflogen.
Karsten has me to Japan flown
'Karsten flew me to Japan.'
- b. *Karsten hat nach Japan mich geflogen.
- c. Nach Japan geflogen hat Karsten mich.
- d. ??Mich geflogen hat Karsten nach Japan.
- (37)
-
- a. Er hat es dem Kind geschenkt.
he has it the child given
'He gave it to the child.'
- b. *Er hat dem Kind es geschenkt.
- c. Dem Kind geschenkt hat er es.
- d. *Es geschenkt hat er dem Kind.

The a-sentences show unmarked order. The b-sentences violate the principle of 'weight': nonstressed definite pronouns are 'lighter' than full noun phrases and PPs, meaning the pronoun must precede the noun phrase. The c-sentences demonstrate that the heavier dependent without the lighter

³⁰ *Den Brief* is shown as a daughter of *versucht* due to the acceptability of *Den Brief versucht zu lesen hat nur einer*. In this regard, note the ungrammaticality of **Den Brief versucht hat nur einer zu lesen*. This permutation is disallowed because *den Brief* must attach to *versucht*; it cannot attach to *hat* due to the V2 principle. As a dependent of *versucht*, it has not risen. The Scrambling Principle allows dependents to rise, meaning the head of the risen dependent must dominate the governor of that dependent.

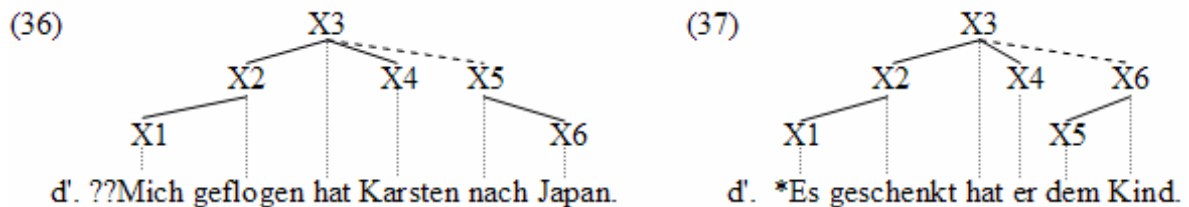
dependent can be fronted together with the nonfinite verb. And the d-sentences demonstrate that the lighter dependent without the heavier dependent may not be fronted together with the nonfinite verb. This curious aspect of fronted infinitives is acknowledged elsewhere, e.g. Heidolph et al. (1981: 721), Fanselow (1987: 94f.), Hinrichs and Nakazawa (1994: 94), Nerbonne (1994: 112f.), ZHS (1997: 1634), Eroms (2000: 368), Wöllstein-Leisten (2001: 106ff., 218ff.), Müller (2002: 95f.).

The current system accounts for these cases by referencing rising and the relative weight of the risen dependent(s). Among the dependents of a governor, a heavier dependent may not rise if a lighter one does not also rise. This aspect of rising is added to the Scrambling Principle as part (ii).

Scrambling Principle

- (i) If a word has the feature +s, then its dependents can rise to non-fronting (as well as fronting) positions.
- (ii) A dependent may not rise to a non-fronting position if its governor has a lighter dependent that does not also rise.

Examine the trees of (36d, 37d):



Example (36d') violates part (ii) of the Scrambling Principle because the heavier *nach Japan* does, but the lighter *mich* does not, rise. Similarly, (37d') violates part (ii) of the Scrambling Principle because the heavier *dem Kind* does, but the lighter *es* does not, rise.

Additional support for part (ii) of the Scrambling Principle is found with the *third construction*. The heavier constituent may not scrambling rise to the Mittelfeld unless the lighter constituent also rises:

- (38) a. Karsten hat mich versucht, nach Japan zu fliegen.
 Karsten has me tried to Japan to fly
 'Karsten tried to fly me to Japan.'
- b. ??Karsten hat nach Japan versucht, mich zu fliegen.
- c. Karsten hat mich nach Japan versucht zu fliegen.

- (39) a. Er wird es versuchen, dem Kind zu schenken.
 Hewill it try the child to give
 'He will try to give it to the child.'
- b. *Er wird dem Kind versuchen, es zu schenken.
- c. Er wird es dem Kind versuchen zu schenken.
- (40) a. Er dürfte ihr beginnen, viele sehr schöne und teure Blumen zu senden.
 He may her begin many very nice and expensive flowers to send
 'He will probably begin sending her many very nice and expensive flowers.'
- b. *Er dürfte viele sehr schöne und teure Blumen beginnen, ihr zu senden.
- c. Er dürfte ihr viele sehr schöne und teure Blumen beginnen zu senden.

Fronted infinitivals taking pseudoincoherent *zu*-infinitives provide another source of support for part (ii) of the Scrambling Principle.

- (41) a. Euch versuchen alle Geheimnisse mitzuteilen dürfen wir nicht.
 you try all secrets to tell may we not
 'We are not allowed to try to tell you all the secrets.'
- b. *Alle Geheimnisse versuchen euch mitzuteilen dürfen wir nicht.
- (42) a. Ihr wagen etwas Negatives zu sagen sollte man nicht.
 her risk something negative to say should one not
 'One should not dare to say something negative to her.'
- b. *Etwas Negatives wagen ihr zu sagen sollte man nicht.

The a-sentences have the lighter constituent rising to attach as predependents to the bare infinitives, whereby the heavier constituent remains a dependent of the *zu*-infinitive. In the b-sentences, the opposite situation obtains.³¹

³¹ The following cases discussed by Fanselow (1987: 94f.) challenge part (ii) of the Scrambling Principle:

- (i) a. Sie hat das Brot in ihrer blauen Schürze gebacken.
 b. *?In ihrer blauen Schürze gebacken hat sie das Brot.
- (ii) a. Sie hat das Brot besoffen gebacken.
 b. *?Besoffen gebacken hat sie das Brot.

To conclude this section, a word of caution is necessary about those instances of rising that do and do not qualify as scrambling. As Grewendorf and Sabel (1994: 293), G. Müller (1998: 18, fn.17) observe, fronting rising (e.g. topicalization, *w*-fronting, relative pronoun fronting) is much more liberal than scrambling rising. In this regard, the Scrambling Principle is intended to address only those instances of rising that traditionally fall under the rubric of scrambling. It says nothing about fronting and extraposition discontinuities. The discussion returns to aspects of weight in section 5.3.

5.2 The Predicate Serialization Principle

The extraposition and bare infinitive fronting data from sections 3.1.1 and 3.1.3 demonstrate that with respect to positional restrictions, coherent constituents behave much differently than incoherent and pseudoincoherent constituents. Coherent constituents may not be extraposed over their predicate governors, nor may the governor of a coherent constituent be fronted without its predicate daughter. Osborne (2005b) presents a principle of serialization that predicts these cases. He calls it the *Predicate Serialization Principle*. This principle is expressed here in terms of the feature $\pm p$ (=predicate):

Predicate Serialization Principle: If X and Y are +p words, X is Y's governor, and X is not a matrix root, then Y must precede X. (Adapted from Osborne (2005b))

The Predicate Serialization Principle is a far-reaching principle of word order in German. It predicts the ungrammaticality of the b- and c-sentences in the following cases:^{32, 33}

These examples appear to contradict part (ii) of the Scrambling Principle. The a-sentences indicate that *in ihrer blauen Schürze* in (i) and *besoffen* in (ii) can be heavier than *das Brot*. This situation predicts that (ib) and (iib) should be acceptable. Since they are bad, part (ii) of the Scrambling Principle is challenged. The answer to this challenge is with a theory of adjunct placement. If one assumes that the adjuncts in question are sentence adjuncts, as opposed to verb adjuncts, and must therefore attach to the roots of the predicate chains, and not to their lowest links, then (ib) and (iib) violate the V2 principle; the ungrammaticality is thus expected.

³² Osborne (2005b) emphasizes that there are two exceptions to the Predicate Serialization Principle that have received a lot of attention in the literature. These exceptions occur with the *auxiliary flip* associated with the *Oberfeld* 'upper field' – see

- (43) a. Sie hat schlafen dürfen. - Perfect active with modal verb
 she has sleep be.allowed
 'She was allowed to sleep.'
- b. *Sie hat dürfen schlafen.
- c. *Dürfen hat sie schlafen.
- (44) a. Das Fahrrad wird repariert werden. - Future passive
 the bicycle will repaired be
 'The bicycle will be repaired.'
- b. *Das Fahrrad wird werden repariert.
- c. *Werden wird das Fahrrad repariert.
- (45) a. Er ist gesehen worden. - Perfect passive
 he is seen been
 'He has been seen.'
- b. *Er ist worden gesehen.
- c. *Worden ist er gesehen.
- (46) a. Sie hat alles geschenkt bekommen. - *Bekommen* passive
 she has all given received
 'She received everything as a gift.'
- b. *Sie hat alles bekommen geschenkt.
- c. *Bekommen hat sie alles geschenkt.
- (47) a. Die Wohnung kann wohl renoviert sein. - Statal passive
 the apartment can certainly renovated be
 'The apartment can certainly have been renovated.'

Hinrichs and Nakazawa (1989, 1994). These constructions generally involve the double infinitive associated with the *Ersatzinfinitiv* 'replacement infinitive' (IPP - infinitivus pro participio). The discussion here shall not examine these cases.

³³ According to Schmid and Vogel (2004), many Swiss dialects prefer the verb ordering Aux-Modal-Main, e.g. *hat dürfen schlafen* for (43). Hence the Predicate Serialization Principle is invalid for these dialects.

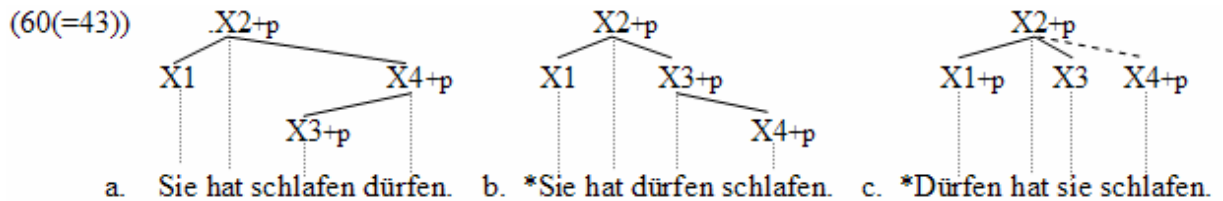
- b. *Die Wohnung kann wohl sein renoviert.
- c. *Sein kann die Wohnung wohl renoviert.
- (48) a. Sie ist stolz gewesen. - Perfect with copular verb
 she is proud been
 'She has been proud.'
- b. *Sie ist gewesen stolz.
- c. *Gewesen ist sie stolz.
- (49) a. Der Hund wird dein bester Freund sein. - Future with copular verb
 the dog will your best friend be
 'The dog will be your best friend.'
- b. *Der Hund wird sein dein bester Freund.
- c. *Sein wird der Hund dein bester Freund.
- (50) a. Sie scheint müde zu sein. - Modality verb with copular verb
 she seems tired to be
 'She seems to be tired.'
- b. *Sie scheint zu sein müde.
- c. *Zu sein scheint sie müde.
- (51) a. Niemand will ihn anrufen. - Separable prefixes
 no.one wants him to.call
 'No one wants to call him.'
- b. *Niemand will ihn rufen an.
- c. *Rufen will niemand ihn an.
- (52) a. Sie konnte uns spielen hören. - Aci structures
 she could us play hear
 'She could hear us playing.'
- b. *Sie konnte uns hören spielen.
- c. *Hören konnte sie uns spielen.

- (53) a. Sie muss ihn gehen lassen. - *lassen*+infinitive structures
 she must him go let
 'She must let him go.'
- b. *Sie muss ihn lassen gehen.
- c. *Lassen muss sie ihn gehen.
- (54) a. Wir müssen morgen einkaufen gehen. - *Gehen* plus infinitive
 we must tomorrow shopping go
 'We have to go shopping tomorrow.'
- b. *Wir müssen morgen gehen einkaufen.
- c. *Gehen müssen wir morgen einkaufen.
- (55) a. Sie hat gut ausgesehen. - Subject predicates
 she has good looked
 'She looked good.'
- b. *Sie hat ausgesehen gut.
- c. ??Ausgesehen hat sie gut.
- (56) a. Das Wetter hat uns traurig gemacht. - Object predicates
 the weather has us sad made
 'The weather has made us sad.'
- b. *Das Wetter hat uns gemacht traurig.
- c. *Gemacht hat uns das Wetter traurig.
- (57) a. Sie will das in Anspruch nehmen. - Function verbs
 she wants that in claim take
 'She wants to lay claim to that.'
- b. *Sie will das nehmen in Anspruch.
- c. *Nehmen will sie das in Anspruch.
- (58) a. Sie wird Auto fahren. - Function nouns
 She will car drive
 'She will drive.'
- b. *Sie wird fahren Auto.
- c. *Fahren wird sie Auto.

- (59) a. Wir wollen noch einen pfeifen. - Idiomatic expressions
 we want still one whistle
 ‘We want to drink another one.’
- b. *Wir wollen pfeifen noch einen.
- c. *Pfeifen wollen wir noch einen. (Disallowed on idiomatic reading)

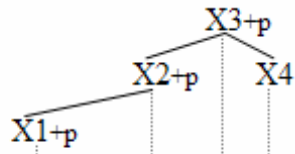
This list can serve as a tentative inventory of predicate types. The ungrammaticality of the c-sentences is widely acknowledged, but poorly understood, e.g. Engel (1982: 225), Olszok (1983: 109), Fanselow (1987: 93), Grewendorf (1988: 300f.), Nerbonne (1994: 118, 136ff.), ZHS (1997: 1623ff), Bouma and Van Nord (1998: 62f.), Kathol (1998: 230f., 2000: 205), Meurers (1999: 245), Webelhuth and Ackerman (1999), De Kuthy and Meurers (2001: 164f), and Müller (2002: 44f., 72, 82, 97f.). The strength of the Predicate Serialization Principle is that it provides a unified explanation of both the b- and c-sentences. The governor of a predicate word may not precede its predicate daughter unless that governor is the matrix root.

A non-matrix-root +p word must follow its +p daughter. The trees of (43a–c) illustrate the effect of the +p feature. Since the root words are always part of the matrix predicate, they also carry the +p feature.

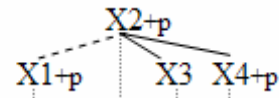


The bare infinitives *dürfen* and *schlafen* are inherently +p. *Dürfen* in each case is the governor of *schlafen* and is not the matrix root. Therefore the Predicate Serialization Principle dictates that ungrammaticality results if *schlafen* follows its governor *dürfen*. In contrast, grammaticality obtains if *schlafen* precedes *dürfen*; this is true also regardless of whether rising occurs.

(60)



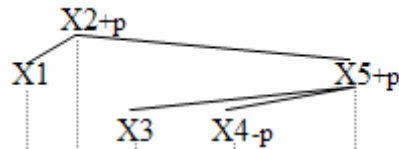
d. Schlafen dürfen hat sie.



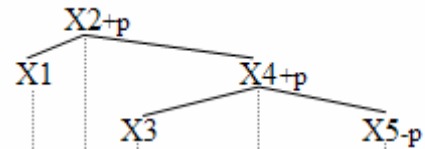
e. Schlafen hat sie dürfen.

The ungrammaticality illustrated in (60b–c) does not occur if the relevant words are -p. This fact is illustrated first with the incoherent constituent *zu gehen* in (61a–f):

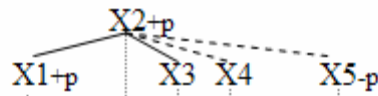
(61)



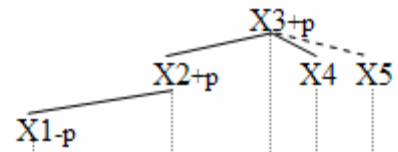
a. Sie hat mich zu gehen gezwungen.
she has me to go forced
'She forced me to go.'



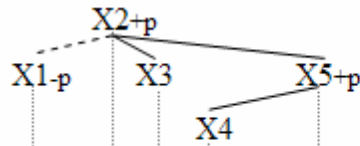
b. Sie hat mich gezwungen zu gehen.³⁴



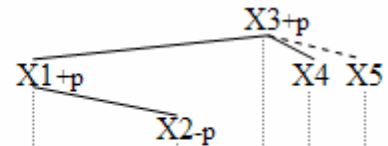
c. Gezwungen hat sie mich zu gehen.



d. Zu gehen gezwungen hat sie mich.



e. Zu gehen hat sie mich gezwungen.



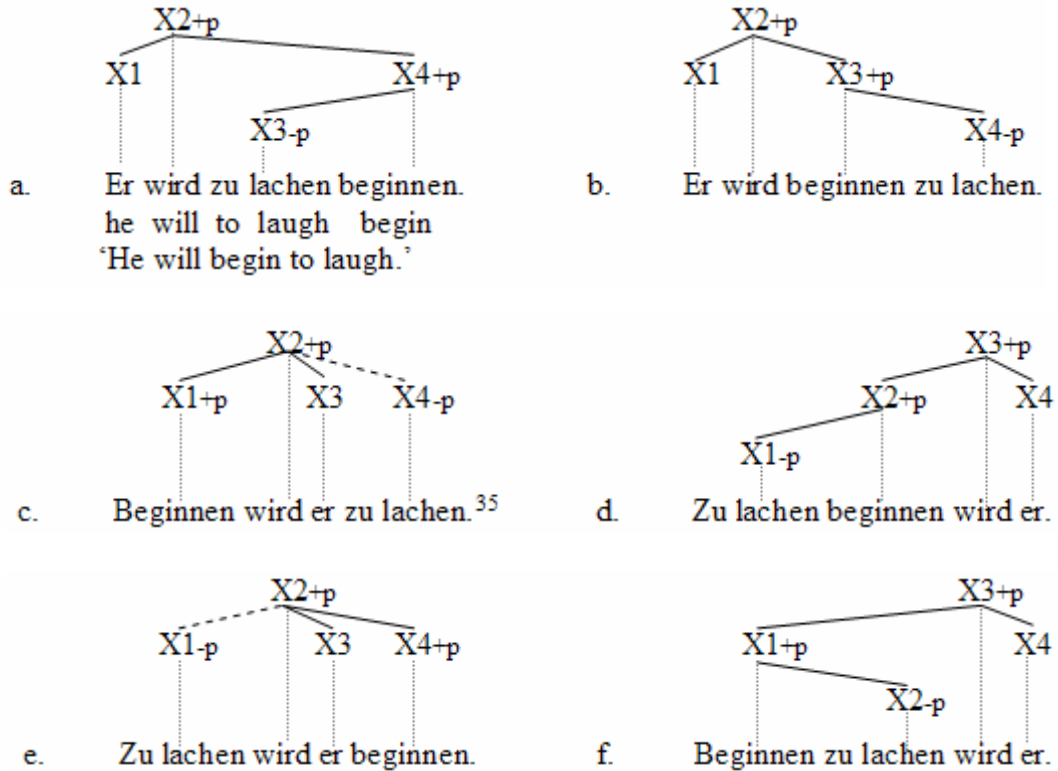
f. Gezwungen zu gehen hat sie mich.

In these cases, *gezwungen* is +p and assigns -p to *zu gehen*. The result is that the Predicate Serialization Principle does not restrict the relative order of *gezwungen* and *zu gehen*.

³⁴ *Zu gehen* in (61b) is shown as a post-dependent of *gezwungen*. Another possibility is that *zu gehen* actually rises to attach to *hat*. I have chosen the former analysis due to the acceptability of (61f).

Since potentially pseudoincoherent constituents behave like incoherent constituents with respect to extraposition and bare infinitive fronting, they too are -p constituents.

(62)



In these cases, *beginnen* is +p and assigns -p to *zu lachen*. Since *zu lachen* is -p, its position with respect to its governor *beginnen* is not restricted.

5.3 The Predicate Weight Principle

The Predicate Serialization Principle requires all links of a predicate chain below the matrix root to be left-branching. There are, however, two additional types of data examined in the literature that are of interest in this area. The first is intraposition:

- (63) a. **dass das Pferd verkaufen* keiner will. - Coherent
 that the horse sell nobody wants
 'that nobody wants to see the horse'

³⁵ Similar to the situation with *gezwungen* in (61c), the rising in (62c) is possible because *beginnen* is part of the matrix predicate, i.e. it is +s.

- b. dass *das Pferd zu verkaufen* keiner beabsichtigt - Incoherent
 that the horse to sell nobody intends
 ‘that nobody intends to sell the horse’
- c. dass *das Pferd zu verkaufen* keiner begehrt - Incoherent
 that the horse to sell nobody desires
 ‘that nobody desires to sell the horse’

Each of these sentences obeys the Predicate Serialization Principle. The constituent *das Pferd zu verkaufen* in (63b) and (63c) is a -p constituent, so its position cannot violate the Predicate Serialization Principle. The constituent *das Pferd verkaufen* in (63a), however, is a +p constituent, which means it must precede its governor *will*, which it does. Why then is (63a) ungrammatical? Nothing established so far predicts this ungrammaticality.

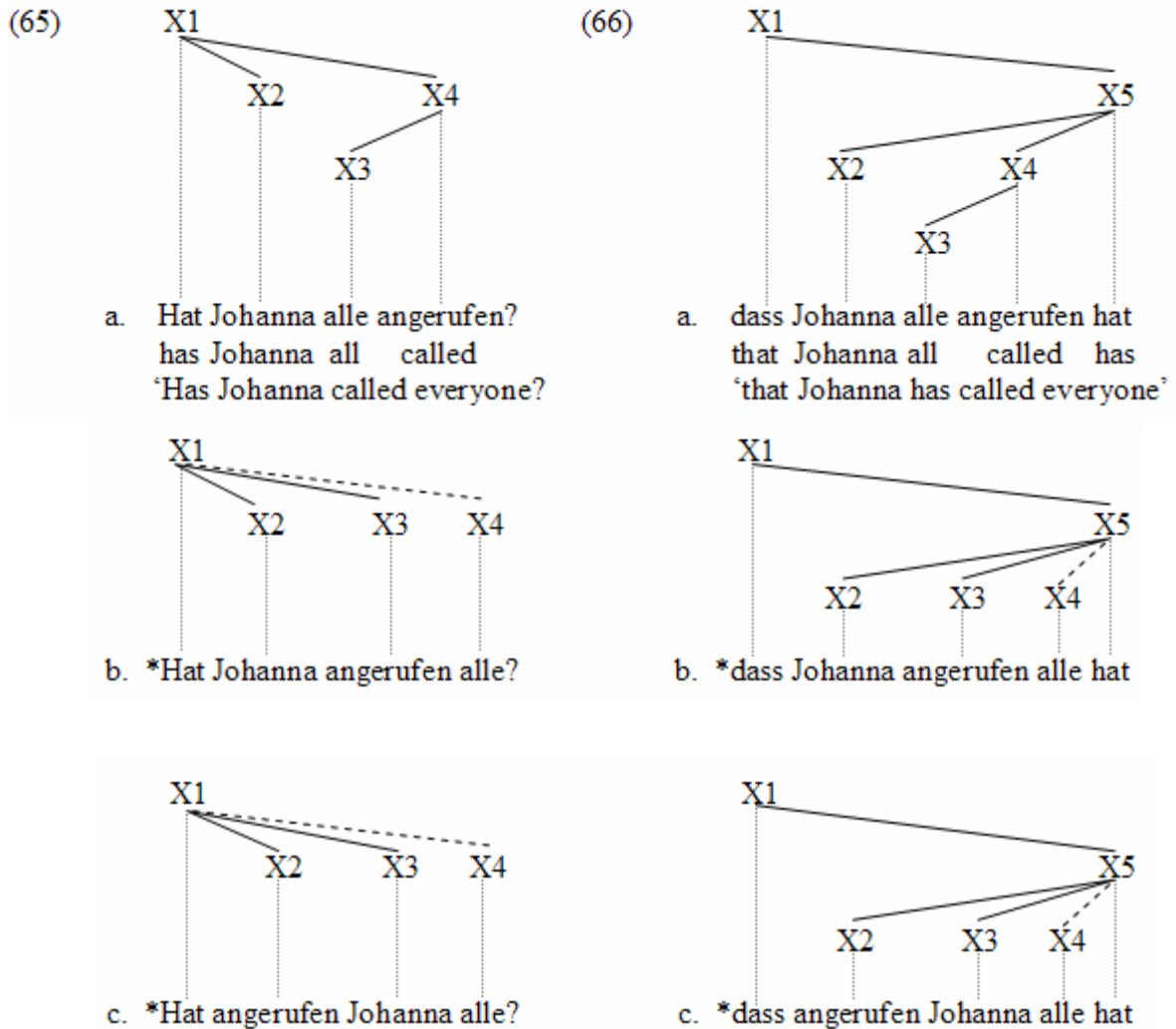
The second case that is of interest in this area is evident in the following data:

- (64) a. *dass verkaufen das Pferd keiner will - Coherent
 that sell the horse nobody wants
 ‘that nobody wants to sell the horse’
- b. *dass zu verkaufen das Pferd keiner beabsichtigt - Pseudoincoherent
- c. *dass zu verkaufen das Pferd keiner begehrt - Incoherent

Data like (64a–c) are discussed in the literature, e.g. Fanselow (1989: 3), Grewendorf and Sabel (1994: 266, 284ff., 294), Reape (1994: 192ff.), Müller (1998: 214ff.), Grewendorf and Sabel (1999: 42f.), Sabel (1999: 432f.). The uncontroversial assumption that NPs always attach as pre-dependents to their infinitival governors – never as post-dependents – means that *das Pferd* in (64a–c) has undergone scrambling rising. The Scrambling Principle thus predicts the ungrammaticality of (64c), since in this case *zu verkaufen* is a -s word. It does not, however, predict the ungrammaticality of (64a–b), since *verkaufen* and *zu verkaufen* are +s words. What is responsible for the ungrammaticality of (64a–b)? Nothing established so far predicts this ungrammaticality.

To answer these questions, the current approach points to an additional principle of word order that is independent from the Scrambling Principle and Predicate Serialization Principle. This additional principle considers the relative ‘weight’ of the constituents involved. The basic

observation is that +p words outweigh -p words, and furthermore, +s words outweigh -s words. Consider the following data in this regard:



Standard assumptions explain the ungrammaticality of the b- and c-examples by referring to the sentence frame. NP arguments do not appear in the right bracket or Nachfeld, but rather they are restricted to appearing in the Vorfeld or Mittelfeld. Given the current dependency grammar approach, the pertinent insight in this regard is that the +s +p infinitival verb *angerufen* is part of the predicate chain *hat...angerufen*. The nominals *Johanna* and *alle* are, in contrast, -s -p dependents of that predicate chain. Apparently when equi-level constituents appear on the same side of their head, +s constituents outweigh -s constituents, and +p constituents outweigh -p constituents.

This insight is formalized here as the Predicate Weight Principle:

Predicate Weight Principle: A +s constituent generally outweighs its -s co-sisters, and a +p constituent generally outweighs its -p co-sisters.

Saying that one constituent is ‘heavier’ than another is only pertinent if the two are sister constituents that appear on the same side of their head. The term *co-sisters* is used to denote this relation. A heavier constituent appears to the right of its ‘lighter’ co-sisters. In (65) for instance, *Johanna* and *alle angerufen* are co-sisters. Since the root of *alle angerufen* is part of the predicate chain, it is a +s +p constituent. *Johanna*, in contrast, is -s -p constituent. Therefore the Predicate Weight Principle requires *alle angerufen* to appear to the right of *Johanna*. Consider (65b) next: there *alle* has risen so that *Johanna*, *angerufen*, and *alle* are co-sisters. Ungrammaticality obtains because the lighter -s -p argument *alle* appears to the right of the heavier +s +p predicate *angerufen*. This reasoning explains the data (65c) and (66a–c) as well.

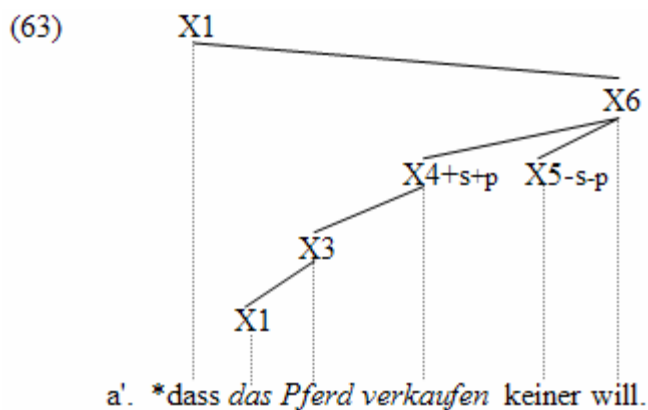
It is easily possible to survey the structures where the Predicate Weight Principle plays a role:

- (67) a. Er will die Kinder verwöhnen. - Post-root domain of declarative
 he wants the children spoil V2 clauses
 ‘He wants to spoil the children’
 b. *Er will verwöhnen die Kinder.
- (68) a. Wessen Hut haben die Kinder gefunden? - Post-root domain of
 whose hat have the children found interrogative V2 clauses
 ‘Whose hat did the children find?’
 b. *Wessen Hut haben gefunden die Kinder?
- (69) a. Darf er ein Eis bekommen? - Post-root domain of
 May he an icecream receive interrogative V1 clauses
 ‘Is he allowed an icecream?’
 b. *Darf er bekommen ein Eis?
- (70) a. Lass die Leute schlafen. - Post-root domain of
 let the people sleep imperative V1 clauses
 ‘Let the people sleep.’
 b. *Lass schlafen die Leute.

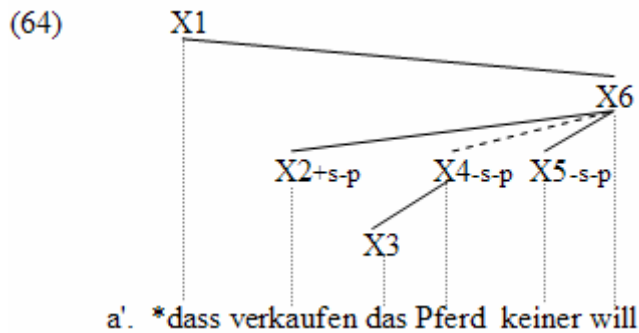
- b. *Wir hörten arbeiten die Arbeiter.
- (76) a. Er bringt seine Sachen in Ordnung. - Function verb structures
 he brings his things in order
 'He is bringing his things in order.'
 b. *Er bringt in Ordnung seine Sachen.
- (77) a. Jetzt hören alle Radio. - Function noun structures
 now listen all radio
 'Everyone is listening to the radio now.'
 b. *Jetzt hören Radio alle.

In each case, the two constituents that are switched are co-sisters. The a-sentences observe the Predicate Weight Principle; they have the predicate constituent following the non-predicate constituent. The opposite situation obtains in the b-sentences, hence the ungrammaticality.

The discussion can now return to examples (63–64) from the beginning of this section. The dependency structure of (63a) is produced here:



Das Pferd verkaufen and *keiner* are co-sisters. The Predicate Weight Principle is violated because the +s +p *das Pferd verkaufen* does not follow its -s -p co-sister *keiner*. The analysis of (64a) is similar:



Since the relevant co-sisters are all $-p$, only the feature $\pm s$ is important. The violation occurs because the $+s$ *verkaufen* does not follow both of its lighter $-s$ co-sisters *das Pferd* and *keiner*. The analysis of (63b) is similar because *zu verkaufen* is a $+s$ pseudoincoherent word.

The Predicate Weight Principle predicts the ungrammaticality in many other cases as well. For instance, it predicts the ungrammaticality of the following b-examples:

(78) a. dass den Hund zu füttern zweifellos keiner versuchte
 that the dog to feed doubtless no.one tried
 ‘that no one tried to feed the dog’

b. *dass den Hund zweifellos zu füttern keiner versuchte

(79) a. weil uns anzurufen die Kinder mehrmals wagten
 because us to.call the kids many.times dared
 ‘because the kids dared to call us many times’

b. *weil uns die Kinder anzurufen mehrmals wagten

(80) a. obwohl den Text niemand zu übersetzen beginnt
 although the text no.one to translate begins
 ‘although no one is beginning to translate the test’

b. *obwohl den Text niemand zu übersetzen heute beginnt
 although the text no.one to translate today begins
 ‘although no one will begin to translate the text today’

Examples (78a, 79a) are fine because the *zu*-infinitives can be $-s$ words, so rising is not forced. The positions of the object NPs in (78b, 79b), in contrast, necessitate an analysis in terms of rising, which means that *zu füttern* and *anzurufen* must be $+s$ pseudoincoherent words. As $+s$ words,

they outweigh their -s co-sisters *keiner* and *mehrmals*, respectively, and must therefore appear to the right of them. Examples (80a–b) are particularly telling. *Zu übersetzen* in both cases is a +s word; thus it outweighs its co-sisters and must appear to their right. In (80a), *zu übersetzen* does indeed appear to the right of all its co-sisters, but in (80b), its co-sister *heute* illicitly follows it.

The presentation of the Predicate Weight Principle here has been very brief. Unfortunately there is not enough space in this paper to explore many of the intricacies of, and exceptions to, the principle. A comprehensive investigation of the principle must wait for another day.

6. Extending the analysis to NPs

A particular strength of the current approach is that it can be extended to other constituents beyond infinitival phrases. For instance, it is applicable to NPs. Data like the following are discussed by De Kuthy and Meurers (2001):

- (81) Keiner hat ein Buch über diese Theorie gelesen.
 Nobody has a book about this theory read
 ‘Nobody read a book about this theory.’
- a. Ein Buch über diese Theorie hat keiner gelesen.
 - b. Keiner hat über diese Theorie ein Buch gelesen.
 - c. Ein Buch hat keiner über diese Theorie gelesen.
 - d. Gelesen hat keiner über diese Theorie ein Buch.
 - e. Hat keiner über diese Theorie ein Buch gelesen? etc.
- (82) Keiner hat das Buch über diese Theorie gelesen.
 Nobody has the book about this theory read
 ‘Nobody read the book about this theory.’
- a. Das Buch über diese Theorie hat keiner gelesen.
 - b. *Keiner hat über diese Theorie das Buch gelesen.
 - c. *Das Buch hat keiner über diese Theorie gelesen.
 - d. *Gelesen hat keiner über diese Theorie das Buch.
 - e. *Hat keiner über diese Theorie das Buch gelesen? etc.

Similar data could easily be produced for subordinate clauses as well. The contrast in acceptability between (81b–e) and (82b–e) is due the specificity effect. Indefinite complement nouns can be transparent for scrambling rising as in (81b–e). If the noun in question is sufficiently specified however, then it becomes opaque for scrambling rising as in (82b–e). In

this case, the contrast is induced by the presence vs. absence of the specifying definite article *das*.

It should be apparent that the noun *Buch* in (81) is behaving essentially like a pseudoincoherent word; it has the feature combination +s -p. It is thus transparent for scrambling rising but at the same time not subject to the strict positional restrictions placed on predicate words. Consider that many of the tests employed above to identify coherent, pseudoincoherent, and incoherent constituents support the analysis of *Buch* in (81) as a potential pseudoincoherent word. These tests can be adapted to NPs as shown here:

- (83) a. Sie hat ein Buch über diese Theorie im Bus gelesen. - Intraposition
 she has a book about this theory in.the bus read
 ‘She read a book about this theory in the bus.’
- b. Lesen wird sie ein Buch über diese Theorie. - Infinitive fronting
- c. Gelesen hat sie ein Buch über diese Theorie. - Infinitival fronting
- d. Sie wird über diese Theorie ein Buch lesen. - Scrambling
- e. Sie hat kein Buch über diese Theorie gelesen. - Scope of negation
 she has no book about this theory read
 ‘She hasn’t read a book about this theory.’
- f. Sie liest ein Buch über diese Theorie, und er über jene. - Gapping
 she reads a book about this theory and he about that
 ‘She is reading a book about this theory, and he/him about that one.’

The inability of NPs to attach as post-dependents to their infinitival governors and the Predicate Weight Principle combine to render the extraposition test in this case inapplicable, e.g. **Sie hat gelesen ein Buch über diese Theorie.*³⁶ Pied-piping is also inapplicable to NPs, e.g. **die*

³⁶ Based on the following data, we know that *zu*-infinitives can, but NPs cannot, attach to their infinitival governors as post-dependents:

- (i) a. Zu essen versuchen werden wir schon.
 to eat try will we certainly
 ‘We will certainly to eat.’
 b. Versuchen zu essen werden wir schon.

*Theorie, das Buch über die ich gelesen habe.*³⁷ And concerning the position of negation test, it is rendered inapplicable by the necessity that cohesion obtain. The other six tests, however, show that *Buch* is indeed behaving like a pseudoincoherent word.

With respect to the overall theory of coherence developed in this paper, the data in (81–83) are important. They demonstrate that the current theory extends beyond the infinitival verbs most closely associated with theories of coherence.

7. A problem

Aci structures pose a problem for the current theory. Data like the following are discussed by Grewendorf (1988: 283ff.), Prinzhorn (1990: 204ff.), Reape (1994).

- (84) a. Natürlich wird Daniel die Kinder *die Pizza essen* lassen.
 of.course will Daniel the children the pizza eat allow
 ‘Of course Daniel will let the children eat the pizza.’
- b. *Natürlich wird Daniel die Pizza die Kinder essen lassen.
- c. *Natürlich wird die Pizza Daniel die Kinder essen lassen.

The relevant constituent is in italics in (84a). It is easy to show that *die Pizza essen* behaves as a coherent constituent with respect to extraposition, intraposition, bare infinitive fronting, infinitival fronting, pied-piping, and the position and scope of negation. With respect to scrambling though, problems arise. The theory predicts the scrambling in (84b–c) to be possible. The fact that these sentences are bad, however, indicates that there is some particular aspect of aci-structures that needs to be identified

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- (ii) a. Pizza essen werden wir schon.
 pizza eat will we certainly
 ‘We will certainly eat pizza.’
- b. *Essen Pizza werden wir schon.

With the V2 principle in mind, sentences (ia-b) demonstrate that *zu*-infinitives have the option to attach as pre- or post-dependents to their infinitival governors. Sentences (iia-b) demonstrate, in contrast, that NPs must attach as pre-dependents to their infinitival governors.

³⁷ English, however, allows such NP pied-piping, e.g. *the theory, the book about which I’ve read*.

and explored. At present, I do not have an explanation for these data. This matter remains to be worked out at a later date.

8. Conclusion

The dependency grammar analysis of coherence presented in this paper began with the assumption that a three-way distinction is warranted: coherent vs. incoherent vs. pseudoincoherent constituents. The approach views coherence primarily as a principle of subcategorization, not as a matter of topology. The three-way distinction was formalized in terms of two features, $\pm s$ (scrambling) and $\pm p$ (predicate). The various combinations of these three features are as follows:

coherent word	+s	+p
pseudoincoherent word	+s	-p
incoherent word	-s	-p

Referring to these two features, three principles of word order were presented. These three principles are repeated here:

Scrambling Principle

(i) If a word has the feature +s, then its dependents can rise to non-fronting (as well as fronting) positions.

(ii) A dependent may not rise to a non-fronting position if its governor has a lighter dependent that does not also rise.

Predicate Serialization Principle: If X and Y are +p words, X is Y's governor, and X is not a matrix root, then Y must precede X.

Predicate Weight Principle: A +s constituent generally outweighs its -s co-sisters, and a +p constituent generally outweighs its -p co-sisters.

If one adds the V2 principle to this list, then one has the basic components together that result in the topological model. The Vorfeld and left bracket of the model are due to the V2 principle. The Mittelfeld and right bracket are due to the Predicate Serialization Principle and Predicate Weight Principle. And the multiple orderings of constituents in the various fields are possible due to the Scrambling Principle.

One final comment concerning the choice of a dependency-based framework is warranted. While a similar constituency-based approach to coherence is conceivable, such an approach would lack the elegance of the current system. The success of the dependency-based approach is largely due to its understanding of chains. While it is possible to produce a

constituency-based definition of “chain”, such a definition would be quite laborious – see Osborne (2005a). Furthermore, if the constituency-based approach actually succeeded in making the same accurate predictions as the current dependency-based approach, the latter would still be preferable due to its structural minimalism. The dependency-based approach accomplishes a lot with very little.

References

- Ackerman, Farrell & Webelhuth, Gert (1998) *A Theory of Predicates*. CSLI Lecture Notes 76. Stanford: CSLI Publications.
- Anderson, John (1979) *On Case Grammar: Prolegomena to a Theory of Grammatical Relations*. London: Croom Helm.
- Askedal, John Ole (1983) Kohärenz und Inkohärenz in Deutschen Infinitfügungen: Vorschlag zur begrifflichen Klärung. *Lingua* 59: 177–196.
- Baumgärtner, Klaus (1970) Konstituenz und Dependenz. In Hugo Steger (ed.), *Vorschläge für eine strukturelle Grammatik des Deutschen*, pp. 52–77.
- Bech, Gunnar (1955) *Studien über das deutsche Verbum infinitum*. Det Kongelige Danske Videnskabernes Selskab, Historisk-filologiske Meddelelser 35, 2. Copenhagen.
- Besten, Hans den & Rutten, Jean (1989) On verb raising, extraposition and free word order in Dutch. In Dang Jaspers et al. (eds.), *Sentential Complementation and the Lexicon: Studies in Honor of Wim de Geest*, pp. 41–56. Dordrecht: Foris.
- Bouma, Gosse & van Noord, Gertjan (1998) Word order constraints on verb clusters in German and Dutch. In Erhard Hinrichs, Andreas Kathol, & Tsuneko Nakazawa (eds.), pp. 43–72. San Diego: Academic Press.
- Brody, Michael (1998) Mirror Theory: syntactic representation in perfect syntax. *Linguistic Inquiry* 31(1): 29–56.
- (2003) *Towards an Elegant Syntax*. London: Routledge.
- Bröker, Norbert. (2000) Unordered and non-projective dependency grammars. In Sylvain Kahane (ed.), pp. 79–111. Paris: Hermes Sciences Publications.
- De Kuthy, Kordula & Meurers, Walt (2001) On partial constituent fronting in German. *Journal of Comparative Germanic Linguistics* 3(3): 143–205.
- Duchier, Dennis & Debusmann, Rolf (2001) Topology dependency trees: a constraint based account of linear precedence. ACL 2001.
- Duden (1995) *Grammatik der deutschen Gegenwartssprache*. Mannheim: Dudenverlag.
- Eisenberg, Peter (1999) *Grundriß der deutschen Grammatik: Band 2: Der Satz*. Stuttgart: Metzler.
- Engel, Ulrich. (1982) *Syntax der deutschen Gegenwartssprache*. 2nd abridged ed. Berlin: Schmidt.
- Eroms, Hans-Werner (1988) Der Artikel im Deutschen und seine dependenzgrammatische Darstellung. *Sprachwissenschaft* 13, 257–308.
- (2000) *Syntax der deutschen Sprache*. Berlin: Walter de Gruyter.

- Fanselow, Gisbert (1987) *Konfiguralität: Untersuchungen zur Universalgrammatik am Beispiel des Deutschen. Studien zur deutschen Grammatik* 29. Tübingen: Narr.
- (1989) Coherent infinitives in German: Restructuring vs. IP complementation. In Christa Bhatt, Elizabeth Löbel & Claudia Schmidt (eds.), *Syntactic Phrase Structure Phenomena in Noun Phrases and Sentences*, pp. 1–16. Amsterdam: Benjamins.
- Gerdes, Kim & Kahane, Sylvaine (2001) Word order in German: a formal dependency grammar using a topology model. ACL 2001.
- Grewendorf, Günther (1988) *Aspekte der deutschen Syntax: Eine Rektions-Bindungs-Analyse*. Tübingen: Narr.
- Grewendorf, Günther & Sabel, Joachim (1994) Long scrambling and incorporation. *Linguistic Inquiry* 25(2): 263–308.
- (1999) Scrambling in German and Japanese. *Natural Language and Linguistic Theory* 17(1): 1–65.
- Grewendorf, G. & Sternefeld, W. (eds.), *Scrambling and Barriers*. Amsterdam: Benjamins.
- Grimshaw, Jane (1991) Extended projections. Ms. Brandeis University.
- Groß, Thomas (1999) *Theoretical Foundations of Dependency Syntax*. München: Iudicium.
- Haider, Hubert (2003) V-clustering and clause union – causes and effects. In Pieter Seuren & Gerard Kempen (eds.), pp. 91–126. Amsterdam: Benjamins.
- Hays, David (1964) Dependency theory: a formalism and some observations. *Language* 40: 511–525.
- Heidolph, Karl, Flämig, Walter & Motsch, Wolfgang (1981) *Gründzüge einer deutschen Grammatik*. Berlin: Akademie Verlag.
- Henschel, Elke & Weydt, Harald (2003) *Handbuch der deutschen Grammatik*. 3rd completely revised edition. Berlin: Walter de Gruyter.
- Heringer, Hans Jürgen (1996). *Deutsche Syntax Dependentiell*. Tübingen: Stauffenberg.
- Hinrichs, Erhard & Nakazawa, Tsuneko (1989) Flipped out: AUX in German. *Chicago Linguistic Society* 25: 193–202.
- (1994) Linearizing AUXs in German verbal complexes. In John Nerbonne, Klaus Netter & Carl Pollard (eds.), pp. 11–38. Stanford: CSLI Publications.
- (1998) Third Construction and VP extraposition in German: an HPSG analysis. In Erhard Hinrichs, Andreas Kathol, & Tsuneko Nakazawa (eds.), pp. 115–157. London: Academic Press.
- Hinrichs, E., Kathol, A. and Nakazawa, T. (eds.), *Complex Predicates in Nonderivational Syntax. Syntax and Semantics* 30. San Diego: Academic Press.
- Huddleston, Rodney & Pullum, Geoffrey (2002) *The Cambridge Grammar of the English Language*. Cambridge University Press.
- Hudson, Richard (1980) Constituency and dependency. *Linguistics* 18(3/4): 179–198.
- (1984) *Word Grammar*. Oxford: Basil Blackwell.
- (1990) *An English Word Grammar*. Oxford: Basil Blackwell.
- (2000) Discontinuity. In Sylvaine Kahane (ed.), pp. 15–56. Paris: Hermes Sciences Publications.

- Jung, Wha-Young (1995) *Syntaktische Relationen im Rahmen der Dependenzgrammatik*. Hamburg: Buske.
- Kahane, Sylvain (ed.) (2000) *Les grammaires de dépendance (Dependency Grammars). Traitement automatique des langues* 41. Paris: Hermes.
- Kathol, Andreas (1998) Constituency and serialization of verbal complexes. In Erhard Hinrichs, Andreas Kathol, & Tsuneko Nakazawa (eds.), pp. 221–270. San Diego: Academic Press.
- (2000) *Linear Syntax*. New York: Oxford University Press.
- Kiss, Tibor (1994) Obligatory coherence: the structure of German modal verb constructions. In John Nerbonne, Klaus Netter & Carl Pollard (eds.), Stanford: CSLI Publications.
- (1995) *Infinitive Komplementation: neue Studien zum deutschen Verbum infinitum*. Tübingen: Niemeyer.
- Kunze, Jürgen (1975) *Abhängigkeitsgrammatik. Studia Grammatica XII*. Berlin: Akademie-Verlag.
- Kvam, Sigmund (1979) Diskontinuierliche Anordnung von eingebetteten Infinitivphrasen im Deutschen. *Deutsche Sprache* 7: 315–325.
- (1982) Die Einbettung deutscher und norwegischer Infinitivkonstruktionen: Eine kontrastive Studie zur Topologie der Infinitivkonstruktionen im Deutschen und Norwegischen. *Deutsche Sprache* 10: 333–365.
- Lobin, Henning (1993) *Koordinationssyntax als prozedurales Phänomen. Studien zur deutschen Grammatik* 46. Tübingen: Narr.
- Lühr, Rosemarie (1993) *Neuhochdeutsch: Eine Einführung in die Sprachwissenschaft*. 4th unchanged edition. München: Fink.
- Matthews, Peter (1981) *Syntax*. Cambridge University Press.
- Mel'čuk, Igor. (1988) *Dependency Syntax: Theory and Practice*. Albany: State University of New York Press.
- Meurers, Walt. (1999) *Lexical Generalizations in the Syntax of German Non-Finite Constructions*. Doctoral Thesis. Universität Tübingen.
- Miller, J. (1985) *Semantics and Syntax: Parallels and Connections*. New York: Cambridge University Press.
- Müller, Gereon (1998) *Incomplete Category Fronting: A Derivational Approach to Remnant Movement in German*. Dordrecht: Kluwer.
- Müller, Stefan (2002) *Complex Predicates: Verbal Complexes, Resultative Constructions, and Particle Verbs in German*. Stanford: CSLI Publications.
- Nerbonne, John (1994) Partial verb phrases and spurious ambiguities. In John Nerbonne, Klaus Netter & Carl Pollard (eds.), pp. 109–150. Stanford: CSLI Publications.
- Nerbonne, J., Netter, K. and Pollard, C. (eds.), *German in Head-Driven Phrase Structure Grammar*. Stanford: CSLI Publications.
- O'Grady, William (1998) The syntax of idioms. *Natural Language and Linguistic Theory* 16: 79–312.
- Olszok, Klaus (1983) Infinite Formen im Vorfeld. In Klaus Olszok & Edit Weuster, *Zur Worstellungsproblematik im Deutschen*, pp. 89–169. Tübingen: Narr.

- Osborne, Timothy (2003) The Left Elbow Constraint. *Studia Linguistica* 57(3): 233–257.
- (2005a) Beyond the constituent: a dependency grammar analysis of chains. *Folia Linguistica* XXXIX/3–4.
- (2005b) The Predicate Serialization Principle of German. Ms. Pennsylvania State University.
- Pickering, Martin & Barry, Guy (1993) Dependency categorial grammar and coordination. *Linguistics* 31: 855–902.
- Prinzhorn, Martin (1990) Head movement and scrambling domains. In Gunther Grewendorf and Wolfgang Sternefeld (eds.), *Scrambling and Barriers*, pp. 199–215. Amsterdam: Benjamins.
- Quirk, Randolph, Greenbaum, Sydney, Leech, Geoffrey & Svartvik, Jan (1985). *A Comprehensive Grammar of the English Language*. London: Longman.
- Reape, Mike (1994) Domain union and word order variation in German. In John Nerbonne, Klaus Netter & Carl Pollard (eds.), pp. 152–197. Stanford: CSLI Publications.
- Rambow, Owen (2003) Coherent constructions in German: lexicon or syntax. In Pieter Seuren & Gerard Kempen (eds.), pp. 223–242. Amsterdam: Benjamins.
- Reis, Marga & Sternefeld, Wolfgang (2004). Review article: Susanna Wurmbrand *Infinitives, Restructuring and Clause Structure*. *Linguistics* 42(2): 469–508.
- Robinson, Jane (1970) Dependency structures and transformational rules. *Language* 46: 259–285.
- Sabel, Joachim (1999). Coherent infinitives in German, Polish, and Spanish. *Folia Linguistica* 33(3–4): 419–440.
- Schmid, Tanja & Vogel, Rolf (2004). Dialectal variation in German 3-verb clusters. *Journal of Comparative Germanic Linguistics* 7: 235–274.
- Schubert, Klaus (1988) *Metataxis: Contrastive Dependency Syntax for Machine Translation*. Dordrecht: Foris.
- Seuren, P. & Kempen, G. (eds.), *Verb Constructions in German and Dutch*. Amsterdam: Benjamins.
- Siewierska, Anna. (1988) *Word Order Rules*. London: Croom Helm.
- Starosta, Stanley (1988) *The Case for Lexicase: An Outline of Lexicase Grammatical Theory*. London: Pinter Publishers.
- Stechow, Armin von (1984). “Gunnar Bech’s Government and Binding Theory”. *Linguistics* 22, 225–241.
- (1990). Status government and coherence in German. In Günther Grewendorf and Wolfgang Sternefeld (eds.), pp. 143–195. Amsterdam: Benjamins.
- Tarvainen, Kalevi (2000) *Einführung in die Dependenzgrammatik. Germanistische Linguistik* 35. Tübingen: Niemeyer.
- Tesnière, Lucien (1959) *Éléments de syntaxe structurale*. Paris: Klincksieck.
- (1969) *Éléments de syntaxe structurale*. Deuxième édition revue et corrigée. Paris: Klincksieck.
- Trask, Robert (1997) *A Student’s Dictionary of Language and Linguistics*. London: Arnold.

- Webelhuth, Gert & Ackermann, Farrel (1999) A Lexical-Functional analysis of predicate topicalization in German. *The American Journal of Germanic Linguistics and Literature* 11, 1: 1–61.
- Wells, Rulon (1947) Immediate Constituents. *Language* 23: 81–117.
- Wöllstein-Leisten, Angelika (2001) *Die Syntax der dritten Konstruktion: Eine repräsentationelle Analyse zur Monosententialität von 'zu'-Infinitiven im Deutschen*. Tübingen: Stauffenberg.
- Wunderlich, Dieter (1980) Diskontinuierliche Infinitivkonstruktionen im Deutschen: Anmerkungen zu einem Aufsatz von Sigmund Kvam. *Deutsche Sprache* 8: 145–150.
- (ZHS) Zifonun, Gisela, Hoffmann, Ludger, Strecker, Bruno et al. (1997) *Grammatik der deutschen Sprache*. Berlin. v. 2. Berlin: Walter de Gruyter.

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