

Abstract

The present paper investigates a certain subset of clause linkage phenomena and develops a constraint-based account to the empirical fact that clauses need to be distinguished w.r.t their degree of integratedness into a potential matrix clause. Considering as example German, it is shown that the generally assumed twofold distinction between main and subordinate clauses (or root and embedded clauses) does not suffice to deal with the presented data. It is argued that the discussed linkage phenomena originate from syntactic, semantic and pragmatic properties of the clauses involved, and should hence be encoded in grammar.

1 Introduction

In generative grammar, it is commonly assumed that clauses that can stand alone as complete sentences differ grammatically from ones that are dependent on a matrix clause and are in this respect subordinated. This difference is often expressed by a boolean feature called ROOT (or alike), and by analysing +ROOT-clauses as syntactically highest clauses. The stipulation of a ROOT feature has been motivated by an observation going back to Emonds (1970) whereby clauses vary in admitting of so-called root phenomena. Whereas +ROOT clauses support these phenomena, -ROOT clauses disallow them.¹

Contrary to this assumption, Green (1996) argues that the best explanation of the acceptability of root phenomena in embedded clauses is not a syntactic, but a pragmatic one, and thus distinguishing dependent clauses from independent utterances can be done ROOT-less. Working within construction-based HPSG, Green (1996) suggests to introduce a new dimension of clauses, called DEPENDENCY, with three partitions *subordinate*, *main* and *indifferent* with most subtypes of clauses being indifferent as to whether they act as main clauses or subordinate clauses. While Green (1996) is correct in assuming that a binary feature is not justified for the distinction of main and subordinate clauses, her approach must be revised to cover dependent clauses that simultaneously behave like main and subordinate clauses with respect to their syntactic form, their interpretation, and their functional usage, and therefore indicate that a pure pragmatic account is not adequate.

The paper is structured as follows: In the next section, several non-canonical clause linkage phenomena occurring in German will be discussed which challenge any approach implementing a twofold differentiation between main and subordinate clause types. Recent HPSG seems well equipped to handle the presented data as will be shown in sec. 3. There, a constraint-based analysis will be sketched that makes use of the idea that feature structures describing clause types can be organized according to the way the respective clause is linked to its syntactic surrounding. Sec. 4 provides some concluding remarks.

¹For a listing of these phenomena see among many others Hooper and Thompson (1973). As for German, an initial position of the finite verb is usually taken as a typical root property.

2 The Problem

In German, a typical SOV language, canonical subordinate clauses differ from canonical main clauses by the position of the finite verb. Whereas the finite verb in main clauses is fronted (henceforth called ‘V2’), it occurs in clause-final position (henceforth called ‘VF’) in subordinate clauses. (1) exemplifies this well-known fact.

- (1) a. Oskar ist vom Stuhl gefallen.
Oskar has from the chair fallen
‘Oskar has fallen from a chair.’
b. Emma bezweifelt, dass Oskar vom Stuhl gefallen ist.
Emma doubts that Oskar from the chair fallen is
‘Emma doubts that Oskar is fallen from a chair.’

Data like (1) form the basis of previous HPSGian work on the classification of German clause types. The proposed analyses have in common that the position of the finite verb (i.e. V2 versus VF) is ‘hard-wired’ to the sort or the feature representing main and subordinate clauses, resp.

2.1 Pertinent Previous Approaches

All pertinent previous approaches to the distinction of root and subordinate clauses in German, such as Uszkoreit (1987), Kathol (1995) and Netter (1998), follow the idea that a fronted finite verb marks main clauses whereas its final position signals a subordinate clause.

Uszkoreit (1987) formulates restrictions relating the value of the boolean feature $M(AIN)C(LAUSE)$ to the value of the boolean feature $INV(ERTED)$ which represents the finite verb’s clausal position.

Netter (1998) implements a correspondence approach of sentence types and their respective functional meanings² by combining the verbal position and the root-subordinate distinction. He stipulates sorts of the following kind: *V-2 Declarative Main*, *V-Final Declarative Subordinate*, *V-2 Interrogative Main*, *V-Final Interrogative Subordinate*, etc.

The most elaborated account within HPSG is the one of Kathol (1995). As fig. 1 shows, he introduces two subsorts of the sort *clause*, called *root* and *subordinate*, which are cross-classified with sorts representing function types such as *interrogative*, *declarative* and *imperative*. The sort *root* is further partitioned by the sorts *v1* and *v2* reflecting the two possible clause-initial positions of a finite verb. Tracing the traditional descriptive model of Topological Fields, cf. Drach (1937), Kathol (1995) formulates a set of constraints on constituent order domains, cf. Reape (1994), such that the finite verb is restricted to a particular topological field in dependence of the respective sort representing a clause type. Thus, for any

²For a critical evaluation of such an approach, see Reis (1999).

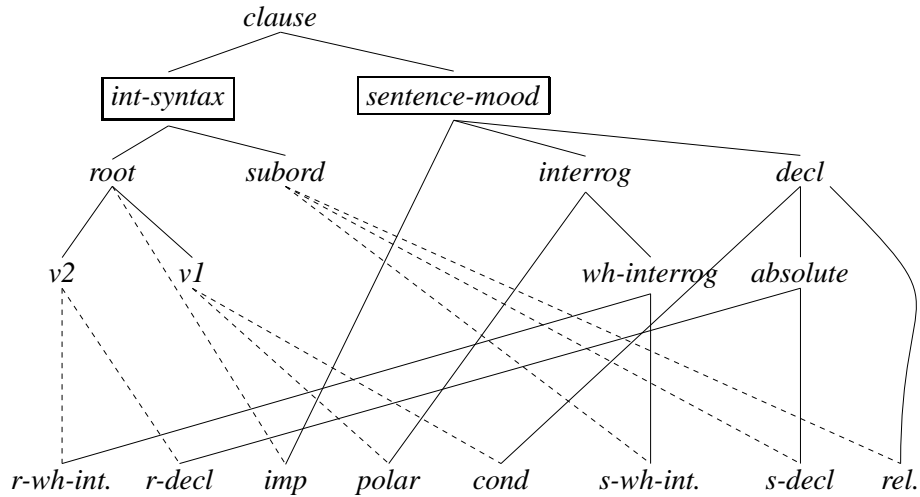


Figure 1: Sort hierarchy of *clause* taken from Kathol (1995)

clause of sort *subordinate* the finite verb has to be in clause final position whereas the finite verb of clauses of sort *root* always stands in clause initial position. Additionally, Kathol (1995) assumes that clauses of sort *root* bear a PHON feature but not clauses of sort *subordinate* arguing that *root* clauses only can be uttered independently.

Splitting clause types into root and subordinate depending on the position of the finite verb and the presence or absence of PHON, as Kathol (1995) does it, yields an approach that classifies dependent V2-clauses such as (2a) as root but independent VF clauses such as (2b) as subordinate, predicting contrary to the facts that the respective V2-clause is uttered independently but not the VF one.

- (2) a. Ich glaube, er hat recht.
 I think he has right
 ‘I think that he is right.’
 b. Ob er noch kommt?
 Whether he still comes
 ‘I wonder whether he will still come?’

Hence, any approach that acts on a dedicated relation between the finite verb’s position and the classification as root or subordinate clause seems to be flawed. The next sections present several data of complex clause constructions showing that it seems to be reasonable to differentiate between canonical and non-canonical clause linkage in German.

2.2 Dependent V2-clauses

Reis (1997) has demonstrated that dependent V2-clauses like (2a) similarly show properties of clear subordinate clauses *and* clear root clauses, and thus can be assigned to either of them. As evidence she gives inter alia that dependent V2-clauses (i) are information-structurally integrated into their matrix clause signaled by a rising tone at the end of the matrix predicate, cf. example (3), (ii) admit variable binding from the matrix clause, cf. example (4), (iii) are restricted to a final position within the matrix clause, which means that they must not occur initially or in the so-called middle field, cf. example (5), (iv) disallow correlatives and *und zwar*-supplements, cf. example (6), and (v) disallow extraction, cf. example (7).³ Properties (i) and (ii) are characteristic for subordinate clauses whereas the properties (iii) to (v) usually substantiate root clauses.

- (3) Ich hatte geglaubt, (/) sie käme.
I had believed she came
 'I had believed that she would come.'
- (4) Jeder_i glaubt, er_i sei der Beste.
Everyone believes he is the best
 'Everyone believes that he is the best one.'
- (5) a. Jeder_i möchte gern glauben, er_i sei unheimlich beliebt.
Everyone want to gladly believe he is_[subj] extremely popular
 'Everyone would like to believe that he is extremely popular.'
 b. * Er_i sei unheimlich beliebt, möchte jeder_i gern glauben.
He is_[subj] extremely popular want to everyone gladly believe
 c. Weil er lange geglaubt hat, sie käme, . . .
Because he for a long time believed has she would come
 'Because he believed for a long time that she would come.'
 d. * Weil er sie käme lange geglaubt hat, . . .
Because he she would come for a long time believed has
- (6) a. Hans hat (*es) geglaubt, Peter geht dahin zu Fuß.
Hans has (it) believed Peter goes there on foot
 'Hans believed Peter goes there on foot.'
 b. Weil Peter (*daran) glaubt, sie ist nett.
Because Peter (that) believes she is nice
 'Because Peter believes she is nice.'
 c. * Peter hat gestanden, und zwar er habe gleich drei Morde
Peter has confessed namely he has_[subj] even three murders
 begangen.
committed

³All examples are taken from Reis (1997).

One might argue that (7) shows contrary to the statement above that extraction is possible out of dependent V2-clauses. Reis (1995), however, has shown that these examples are instances of a parenthetical construction rather than cases of extraction.

- (7) a. Wo glaubst du wohnt man billig?
Where believe you lives one cheaply
 ‘Where do you believe one lives cheaply?’
 b. In Tübingen glaubst du wohnt man billig.
In Tübingen believe you lives one cheaply
 ‘In Tübingen you believe one lives cheaply.’

Besides the mentioned properties, dependent V2-clauses differ semantically and pragmatically from subordinate *dass*-complement clauses. Reis (1997) points out that dependent V2-clauses do not realize an argument of the matrix predicate in the usual way. She argues that dependent V2-clauses are not cases of canonical semantic selection, and, thus, the theta role has to be assigned non-structurally. Further, dependent V2-clauses may not be presupposed. Also, they cannot be interpreted in scope of negation and cannot be combined with negative predicates like *bezweifeln* (‘doubt’), cf. Steinbach (1999):

- (8) a. *Er glaubt nicht, Maria möchte das Theorem beweisen.
He believes not Maria wants to the theorem prove
 b. *Er bezweifelt, Maria möchte das Theorem beweisen.
He doubts Maria wants to the theorem prove

As functional use is concerned, dependent V2-clauses seem to be peculiar as well since they have illocutionary force. Even though their illocutionary association somehow seems to be related to the matrix clause, cf. Boettcher (1972), Reis (1997) and Meinunger (2004), the fact itself shows that the clauses cannot be ordinary embedded clauses, cf. Green (2000b).

If dependent V2-clauses were the single clausal class exhibiting the listed properties, one might seek for an idiosyncratic explanation. In German, however, there exist several types of clauses showing similar mixed properties in terms of a root-subordinate distinction, albeit occurring in miscellaneous syntactic environments.

2.3 Free *dass*-clauses

Reis (1997) provides evidence that the so-called free *dass*-clauses, illustrated by (9), have the properties (i) to (v) listed above.

- (9) Er muss im Garten sein, dass er nicht aufmacht.
He must in the backyard be that he not opens
 ‘He must be in the backyard since he does not open.’

This particularly means that free *dass*-clauses behave like subordinate clauses as they are integrated into the information structure of their host, cf. (10), and a quantifier can bind a variable occurring in a free *dass*-clause, cf. (11).

- (10) Was ist denn HIER los, dass Max so schreit?
What is PART here the matter that Max like that screams
 ‘What is wrong here that Max screams like that?’

- (11) Was hat denn jeder_i hier, dass er_i so rumtoben muss.
What has PART everyone here that he like that romp must
 ‘What is going on here with everyone that he has to romp like that?’

On the other hand, free *dass*-clauses show properties of typical root clauses since they are restricted to a clause final position, cf. (12), they do not allow cor-relatives or supplements, cf. (13), and there is no extraction possible out of them, cf. (14).

- (12) a. Du musst verrückt sein, dass du kommst
You must crazy be that you come
 ‘You must be crazy that you come.’
 b. *Dass du kommst, musst du verrückt sein.
That you come must you crazy be
 c. Was ist denn gerade los, dass er so schreit?
What is PART just now the matter that he like that screams
 ‘What is wrong just now, that he screams like that?’
 d. *Was ist denn, dass er so schreit, gerade los?
What is PART that he like that screams just now the matter
- (13) a. Fritz ist (*es) blöd, dass er kommt.
Fritz is (it) kind of stupid that he comes
 ‘Fritz is kind of stupid to come.’
 b. *Fritz ist blöd, und zwar dass er Ernas Nerzmantel bezahlt.
Fritz is stupid namely that he Erna’s mink coat pays for
- (14) a. *Welchen Mantel ist Fritz blöd, dass er bezahlt?
Which coat is Fritz stupid that he pays for
 b. *Den Nerzmantel ist Fritz blöd, dass er bezahlt.
The mink coat is Fritz stupid that he pays for

In semantic respects, free *dass*-clauses also differ from their canonical counterparts: In contrast to ordinary *dass*-complement clauses, they clearly do not realize an argument of the matrix predicate. In addition, free *dass*-clauses share with dependent V2-clauses that they cannot be interpreted in the scope of negation or negative predicates. That free *dass*-clauses denote facts is likely to be the reason for this.

- (15) a. * Was ist denn nicht los, dass er so schreit?
What is PART not the matter that he like that screams
- b. * Er bezweifelt, dass Fritz blöd ist, dass er Erna den Nerzmantel kauft.
He doubts that Fritz stupid is that he for Erna the mink coat buys

In pragmatic respects, free *dass*-clauses are illocutionary independent as well. Based on the fact they denote, they express a presumption or an assessment.

2.4 V2-relative clauses

There is another class of clauses that behaves all about the same as dependent V2-clauses and free *dass*-clauses, the so-called V2-relatives. An example of this clausal class is given in (25).⁴

- (16) Das Blatt hat eine Seite, die ist ganz schwarz.
The sheet has one side that is completely black
 ‘The sheet has one side that is completely black.’

Gärtner (2001) who thoroughly investigated V2-relatives argues that they are restrictive relative clauses similarly showing properties of typical root and subordinate clauses. A brief outline of his argumentation is presented in the following.

Like dependent V2-clauses and free *dass*-clauses, V2-relatives strictly remain clause final. Thus, they neither can be topicalized nor undergo A-movement as demonstrated by (17).

- (17) a. Ich suche jemanden, den nennen sie Wolf-Jürgen.
I look for someone who call they Wolf-Jürgen
 ‘I’m looking for someone who they call Wolf-Jürgen.’
- b. * Jemanden, den nennen sie Wolf-Jürgen, suche ich.
Someone who call they Wolf-Jürgen look for I
- c. Ich höre, dass jemand gesucht wird, der heißt Wolf-Jürgen.
I hear that someone looked for is who is called Wolf-Jürgen
 ‘I hear that someone is being looked for who they call Wolf-Jürgen.’
- d. * Ich höre, dass jemand, der heißt Wolf-Jürgen, gesucht wird.
I hear that someone who is called Wolf-Jürgen looked for is

Example (18) illustrates that V2-relatives always follow the finite verb of an embedded V-final clause, which means that they are not adjacent to the DP they seem to modify.⁵ (19) indicates that V2-relatives are ordered last with respect to extraposed clauses that modify the same clause as the relative clause.

⁴All examples in this section are taken from Gärtner (2001).

⁵The coordinative construction (i) indicates that clause-finality is not a purely linear but a structural property.

- (18) a. Es gibt Tage, an denen wir etwas erleben, das irritiert uns.
There are days on which we something experience that bothers us.
 'There are days on which we experience something that bothers us.'
- b. * Es gibt Tage, an denen wir etwas, das irritiert uns, erleben.
There are days on which we something that bothers us experience
- (19) a. Ich las von einer Stadt, als ich klein war, deren Häuser sind aus Gold.
I read about a town when I a child was which houses are of gold.
 'When I was a child, I read about a town the houses of which are made of gold.'
- b. * Ich las von einer Stadt, deren Häuser sind aus Gold, als ich klein war
I read about a town which houses are of gold when I a child was

Evidence for the root-like character of V2-relatives comes not only from the afore mentioned ordering facts but also from binding theory. Condition C effects relax in the V2-relative construction, which is illustrated by the —admittedly subtle— contrast in (20).

- (20) a. In Köln traf er_i Leute, die haben Hans_i nicht erkannt.
In Cologne met he people who have Hans not recognize
 'In Cologne he met people who didn't recognize Hans.'
- b. ?? In Köln traf er_i Leute, die Hans_i nicht erkannt haben.
In Cologne met he people who Hans not recognize have

In addition, a quantifier cannot bind a variable in the V2-relative, cf. (21), which is another indication of rootness.⁶

- (21) a. * Keine Linguistin_i mag Studenten, die zitieren sie_i nicht.
No linguist likes students who cite her not.
- b. Keine Linguistin_i mag Studenten, die sie_i nicht zitieren.
No linguist likes students who her not cite
 'No linguist likes students who do not cite her.'

(i) Hans hat Freunde, die lesen gern und Peter hat Freunde, die tanzen gern.
Hans has friends who like reading and Peter has friends who like dancing
 'Hans has friends who like reading and Peter has friends who like dancing.'

⁶In this aspect, V2-relatives differ from dependent V2-clauses and free *dass*-clauses, resp.

More parallels between V2-relatives and dependent V2-clauses as well as free *dass*-clauses can be found in terms of properties characteristic for subordinate clauses: First, V2-relatives are prosodically integrated into the matrix clause as they may not be immediately preceded by intonational final boundary markings such as a falling tone or a pause. Second, V2-relatives constitute a single informational unit together with the matrix clause as shown by (22). The sentences in (22) are 'all-focus' sentences as the focus projects from the DP. DP-internally, the noun and the modifier exhibit an equal amount of stress, which in the case of a sentential modifier is realized on their main verb's complement.

- (22) a. Es gibt PhilSOpen, (/) die kommen aus GRÖNland.
There are philosophers who come from Grönland
 'There are philosophers coming from Grönland'
- b. ... weil es PhilSOpen gibt, (/) die kommen aus GRÖNland.
because there philosophers are who come from Grönland
 '... because there are philosophers coming from Grönland'

Gärtner (2001) further argues that V2-relatives have to be interpreted restrictively since phenomena that usually indicate restrictiveness, such as *eins*-pronominalization and modification of a predication NP, can be observed in V2-relative constructions:

- (23) a. Hans kennt einen Philosophen, der mag Achternbusch, und Maria
Hans knows a philosopher who likes Achternbusch and Maria
 kennt auch einen.
knows also one
 'Hans knows a philosopher who likes Achternbusch and Maria also knows one.'
- b. Maria ist ein Mensch, den solltet ihr nicht unterschätzen.
Maria is a person who should you not underestimate
 'Maria is a person who you shouldn't underestimate.'

There is another peculiarity of V2-relatives also observed by Gärtner (2001): V2-relatives are limited to indefinite noun phrases, i.e. they can only modify indefinite DPs, but true quantifiers and definite descriptions cannot be accessed as an antecedent. This is illustrated by the examples in (24).

- (24) a. * Ich kenne alle Linguisten, die haben über Toba Batak gearbeitet.
I know every linguist who has on Toba Batak worked
- b. * Ich kenne den Linguisten, der hat über Toba Batak gearbeitet.
I know the linguist who has on Toba Batak worked

Last but not least, V2-relative clauses are sensitive to presuppositionality as well. Therefore, they cannot attach to a negated noun phrase as is expected.

- (25) * Das Blatt hat keine Seite, die ist ganz schwarz.
The sheet has no side that is completely black

Thus, the three clausal types, i.e. dependent V2-clauses, free *dass*-clauses and V2-relatives, behave all about the same in terms of a restricted licensing by the matrix clause. The grammatical properties of the clauses just considered indicate that their relation to a potential matrix clause is not canonical inasmuch they are not clear-cut subordinate (embedded) clauses. On the other hand, they do not show properties of well-defined main (root) clauses, either. Interestingly, there exists yet another class of dependent clauses in German that are not canonically linked to their syntactic surrounding. This class comprises at least the so-called V2-adverbial clauses, and non-restrictive relative clauses of any kind, in particular *wh*-relatives. The characteristics of these clausal constructions will be discussed in the following two sections.

2.5 *Weil*-V2-adverbial clauses

In German, there exists an alternative type of standard adverbial clauses introduced by *weil* ('because'), cf. (26), which are paratactic constructions and realize different speech acts than their standard counterparts. Contrary to the standard constructions which are hypotactic the finite verb is fronted in these adverbial clauses.⁷

- (26) Peter kommt zu spät, weil er hat keinen Parkplatz gefunden.
Peter comes too late because he has no parking space found
 'Peter is late because he could not find a parking space.'

Weil-V2-adverbial seem to be root clauses. This hypothesis is substantiated by work of Wegener (1993) and Uhmman (1998) who have independently shown that these clauses are characterized by a specific semantic and functional root-like behaviour which is formally manifested.⁸

First of all, *weil*-V2-adverbial are restricted to a final position, which means that they neither stand in front of their matrix clause nor within it, cf. (27). This is clearly in contrast to *weil*-VL-adverbial clauses, cf. (28).

- (27) a. Peter kommt zu spät, weil er hat keinen Parkplatz
Peter comes too late because he has no parking space
 gefunden.
found
 'Peter is late because he could not find a parking space.'
- b. *Weil er hat keinen Parkplatz gefunden, kommt Peter zu
Because he has no parking space found comes Peter too
 spät.
late

⁷There are adverbial clauses introduced by *obwohl* ('although'), such as *Maria verehrt ihren Mann, obwohl verdient hat er es nicht*. ('Maria admires her husband, although he doesn't deserve it.'), which behave similarly to *weil*-V2-adverbial clauses.

⁸*Weil*-V2-adverbial clauses are mainly attested for colloquial German, but can be observed in written German as well, cf. Wegener (1993), Uhmman (1998).

- c. * Peter kommt, weil er hat keinen Parkplatz gefunden, zu spät.
Peter comes because he has no parking space found too late

- (28) a. Peter kommt zu spät, weil er keinen Parkplatz gefunden hat.
Peter comes too late because he has no parking space found
 'Peter is late because he could not find a parking space.'
- b. Weil er keinen Parkplatz gefunden hat, kommt Peter zu spät.
Because he no parking space found has comes Peter too late
 'Because he could not find a parking space, Peter is late.'
- c. Peter kommt, weil er keinen Parkplatz gefunden hat, zu spät.
Peter comes because he no parking space found has too late
 'Peter, because he could not find a parking space, is late.'

Additionally, *weil*-V2-adverbial clauses cannot be transferred into an adverbial phrase being a component part of the matrix clause, which one would expect if they were subordinate. Further, it is impossible to refer to them by a correlative or to attach them by an *und zwar*-supplement as can be seen in (29).

- (29) a. Peter kommt (*deswegen) zu spät, weil er hat keinen
Peter comes too late because he has no
 Parkplatz gefunden.
parking space found
 'Peter is late because he could not find a parking space.'
- b. * Peter kommt zu spät, und zwar weil er hat keinen
Peter comes too late namely he has no parking space
 Parkplatz gefunden.
found

Example (30a) demonstrates that a *weil*-V2-adverbial clause is illocutionary independent from its host clause, since it expresses a statement being not part of the question raised by the host. This argues for the root character of these clauses, and contrasts with canonical causal clauses as shown in (30b).

- (30) a. Kommt Peter? Weil er hat es versprochen.
Comes Peter because he has it promised
 'Is Peter coming? Because he promised to.'
- b. Kommt Peter, weil er es versprochen hat?
Comes Peter because he it promised has
 'Is Peter coming because he promised to?'

Certain prosodical facts also suggest that *weil*-V2-adverbial clauses behave like root clauses. So, the intonational unit of a *weil*-V2-adverbial clause is separated from the one of the host clause, and the host clause ends with falling intonation.

Evidence for the root-like status of *weil*-V2-adverbial clauses eventually comes from negation and quantifier binding. A *weil*-V2-adverbial clause is not tangent to a negation of the host clause, i.e. the content of the *weil*-V2-adverbial clause is not negated if the host clause contains a negative particle, cf. (31a). Whereas it is denied in (31b) that Peter went home because of a head ache, (31a) means that Peter did not drive home.

- (31) a. Peter ist nicht nach Hause gefahren, weil er hatte Kopfweg.
Peter is not home driven because he had a head ache
 ‘Peter did not drive home because he had a head ache.’
 b. * Peter ist nicht nach Hause gefahren, weil er Kopfweg hatte.
Peter is not home driven because he a head ache had

Moreover, a quantifier in the host clause does not scope over the *weil*-V2-adverbial clause, cf. (32). In comparison to (32b), (32a) justifies why the speaker believes that some guests will come, while (32b) means that some guests will come because of the sunny weather.

- (32) a. Einige Gäste werden kommen, weil heute scheint die Sonne.
Some guests will come because today shines the sun
 ‘Some guests will come, because today the sun is shining.’
 b. Einige Gäste werden kommen, weil heute die Sonne scheint.
Some guests will come because today the sun shines
 ‘Some guests will come, because the sun is shining today.’

Finally, the pragmatic interpretation of *weil*-V2-adverbial clauses is peculiar. They behave differently from canonical *weil*-clauses in that they are able to give reasons for a speaker’s attitude.⁹

2.6 *Wh*-relative clauses

Wh-relative clauses are a subclass of non-restrictive relative clauses that are introduced by a possibly complex *wh*-expression as exemplified by (33).

- (33) Max spielt Orgel, was gut klingt.
Max plays organ which good sounds
 ‘Max is playing the organ, which sounds good.’

As has been shown in Holler (2003) and Holler (2005), *wh*-relatives are prosodically and pragmatically independent from their matrix clause, which is indicated inter alia by an independent focus domain, cf. (34), and an autonomous illocutionary force, cf. (35). The construction in (34) for instance cannot be uttered as an answer to the question *What happened?*, which indicates that the *was*-clause is not integrated into the information structure of the host. Similarly, (35) is ungrammatical, because the *was*-clause has been forced to be a part of the host’s speech act which is a question.

⁹See Haegeman (1984) for a discussion of similar phenomena in English.

- (34) #[Emma kaufte einen teuren Schrank, was ÄRGERlich ist.]_F
Emma bought an expensive cupboard which annoying is
 ‘Emma bought an expensive cupboard, which is annoying.’
- (35) * Hat Emma einen Schrank gekauft, was Oskar erstaunte?
has Emma a cupboard bought which Oskar astonished

Moreover, *wh*-relatives behave like typical root clauses as they are syntactically dispensable, cf. (36), disallow variable binding from outside, cf. (37), and occur only at the very end of a complex sentence, cf. (38), which illustrate that a *wh*-relative follows an extraposed complement clause or relative clause.

- (36) a. Max spielt Orgel, was gut klingt.
Max plays organ which good sounds
 ‘Max is playing the organ, which sounds good.’
 b. Max spielt Orgel.
Max plays organ.
 ‘Max is playing the organ.’
- (37) * Niemand_i gewann das Schachspiel, was ihn_i maßlos ärgerte.
nobody won the game of chess which him extremely annoyed
- (38) a. Es fiel Maria nicht auf, dass sie sich verrechnet hatte,
 EXPL *realized Maria not* PART *that she REFL mistaken had*
 weswegen sie sich jetzt ärgert.
that’s why she REFL now annoyed
 ‘Maria didn’t realize that she made a mistake, and that’s why she is annoyed now.’
 b. * Es fiel Maria nicht auf, weswegen sie sich jetzt ärgerte,
 EXPL *realized Maria not* PART *that’s why she REFL now annoyed*
 dass sie sich verrechnet hatte.
that she REFL mistaken had

Semantically, *wh*-relatives contrast with restrictive relative clauses which are usually analyzed as denoting properties since they are introduced by an anaphoric pronoun and denote propositions. This is certainly a consequence of the non-restrictiveness of the *wh*-relatives. Furthermore, they behave similar to the clauses discussed above in terms of negation since a negative particle in the matrix host does not scope over *wh*-relatives.

Taking all the presented syntactic, semantic and pragmatic properties into account, one has to conclude that *wh*-relatives are not integrated into their host clause.

2.7 Summary of the Data

Looking at the data given so far reveals that three classes of dependent clauses can be distinguished depending on the way of being linked to their linguistic sur-

rounding. Besides the canonical dependent clauses including all clauses that form directly or indirectly a component part of their matrix clause (such as complement clauses of all kinds, ordinary adverbial clauses, restrictive relative clauses, etc.), two classes of dependent, but non-canonically linked clauses can be identified by means of the grammatical properties afore described. Table 1 gives an overall picture of these facts. It strikes that the position of the finite verb is not appropriate to differentiate between these clausal classes. Rather, the data suggest that clauses differ in the degree to which they are integrated into a potential matrix clause. This is in accordance to the results of Fabricius-Hansen (1992) who shows that the linkage of subordinate clauses to their hosts is graded.

Clausal Class	Integrated	Semi-integrated	Non-integrated
Prosodically integrated	yes	yes	no
Syntactically connected	yes	yes	no
Semantically peculiar	no	yes	yes
Indep. information structure	no	no	yes
Indep. illocutionary force	no	yes	yes
Typical example	a (VF)	d (V2)	g (VF)
	b (VF)	e (V2)	h (VF)
	c (VF/V2)	f (VF)	i (V2)

Table 1: Grammatical properties of three empirically identified classes of dependent clauses. For reasons of space, the following abbreviations are used: a = complement clause, b = restrictive relative clause, c = standard adverbial clause, d = dependent V2-clause, e = restrictive V2-relative clause, f = free *dass*-clause, g = non-restrictive *d*-relative clause, h = non-restrictive *wh*-relative clause, i = *weil*-V2-adverbial clause.

3 Accounting for the Facts

The sign-based monostratal architecture of HPSG qualifies very well to account for the presented data. The core of the analysis advocated here is the observation that clauses vary with respect to the way they are linked to their linguistic surrounding. Because this originates from syntactic, semantic and pragmatic properties of the clauses involved, it seems to be natural to encode it in grammar.

In HPSG, the sort hierarchy lends itself to reconstruct the observed distinction. For this reason, it is proposed to partition the sort *phrase* regarding a dimension LINKAGE, and to distinguish between *unlinked* and *linked* objects. The sort *unlinked* comprises all independently uttered sentences including independent verb-final clauses as given by (2b). The sort *linked* describes all objects that are somehow combined with their linguistic surrounding, which applies to all clausal types depicted in table 1. According to the empirical results summarized by table

1, the sort *linked* is further partitioned by three subsorts called *integrated*, *semi-integrated* and *non-integrated* representing clausal objects that are fully, partly or not integrated into a potential matrix clause.¹⁰ It is assumed that the newly defined sorts are cross-classified with subsorts of *headed-phrase* which is an immediate subsort of *phrase* with respect to the dimension HEADEDNESS, cf. Sag (1997).

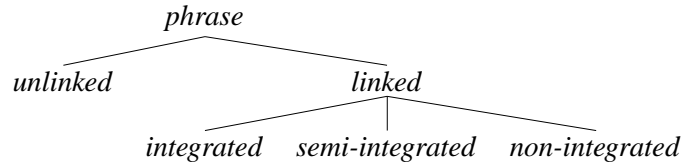


Figure 2: Partition of *phrase* w.r.t. the dimension LINKAGE

Nothing in particular shall be said here about clauses of sort *integrated*, since they are analyzed in a standard way. The two remaining clausal classes of sort *linked*, i.e. *semi-integrated* and *non-integrated* clauses, are certainly more instructive. Next, an analysis will be sketched which formulates restrictions on these two sorts and, thus, captures the syntactic, semantic and pragmatic properties of the clause types discussed in sec. 2.

3.1 Clauses of sort *semi-integrated*

It has been argued that clauses of sort *semi-integrated* are less tightly connected to their matrix clause as they have the properties (iii) to (v) presented in sec. 2. On the other hand, these clauses are obviously syntactically connected with their host because of the properties (i) and (ii), which they also show. In order to cope with this behavior, clauses of sort *semi-integrated* are analyzed as modifiers of a saturated verbal projection, which particularly means that they are no complement clauses since they do not saturate an argument of the matrix predicate.

Further, an approach by Engdahl and Vallduví (1996) is adopted who stipulate an INFO-STRUCTURE attribute enriching CONTEXT to represent the focus-background structure of a clause. It is assumed here that *semi-integrated* clauses identify their INFO-STRUCTURE value with that of the matrix clause, thereby accounting for property (i).

In addition, a suggestion by Green (2000a) is acted on to deal with the fact that semi-integrated clauses are not a part of the speech act of their host, but have illocutionary force of their own.¹¹ Green (2000a) defines an *psoa* object of sort *intend*, which is contained in the BACKGROUND set of a phrase. By requiring that

¹⁰Unfortunately, it cannot be discussed here to which extent this distinction can be used for constituents other than clauses. At least, there is evidence from German and English that nominal left-peripheral elements also need to be classified regarding their degree of (non-)integratedness into a clause, cf. Shaer and Frey (2004).

¹¹Of course, any other analysis of illocutionary force could have been implemented here.

the *intend*-object of the matrix clause, which is the head of the phrase representing the construction, differs from the one of the modifying semi-integrated clause the desired result is achieved. The constraint on objects of sort *semi-integrated* shown in fig. 3 expresses the afore mentioned restrictions.

$$\begin{array}{c}
 \text{semi-integrated} \rightarrow \left[\begin{array}{c} \text{SS} \mid \text{LOC} \left[\begin{array}{c} \text{CAT} \mid \text{HD} \mid \text{MOD} \left[\begin{array}{c} \text{LOC} \left[\begin{array}{c} \text{CAT} \left[\begin{array}{c} \text{HD} \quad \text{verb} \\ \text{SUBCAT} \langle \rangle \end{array} \right] \\ \text{INFO-STRUCT} \boxed{1} \\ \text{CXT} \left[\text{BACKGR} \{ \boxed{2} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \\ \text{CXT} \left[\begin{array}{c} \text{INFO-STRUCT} \boxed{1} \\ \text{BACKGR} \{ \boxed{3} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] \\
 \wedge \boxed{2} \neq \boxed{3}
 \end{array}$$

Figure 3: Restricting *semi-integrated* clauses

Fig. 4 gives an example analysis for the construction *Maria glaubt, Studenten schlafen lange*. (‘Maria believes that students sleep long’), which contains a dependent V2-clause. This clause syntactically modifies its matrix clause expressed by tag $\boxed{1}$. Tag $\boxed{2}$ marks the information structure which comprises the whole construction. Tag $\boxed{3}$ and $\boxed{4}$ represent the illocutionary force of each constituent.

$$\begin{array}{c}
 \left[\begin{array}{c} \text{head-adjunct-phrase} \\ \text{PHON} \langle \text{Maria glaubt Studenten schlafen lange} \rangle \\ \text{SS} \mid \text{LOC} \left[\begin{array}{c} \text{CAT} \mid \text{HD} \text{ verb} \\ \text{CONTEXT} \left[\begin{array}{c} \text{INFO-STRUCT} \boxed{2} \\ \text{BACKGROUND} \{ \boxed{3}, \boxed{4}, \dots \} \end{array} \right] \end{array} \right] \\ \text{HD-DTR} \left[\begin{array}{c} \text{PHON} \langle \text{Maria glaubt} \rangle \\ \text{SS} \boxed{1} \left[\begin{array}{c} \text{LOC} \left[\begin{array}{c} \text{CAT} \mid \text{HD} \text{ verb} \\ \text{CONTEXT} \left[\begin{array}{c} \text{INFO-STRUCT} \boxed{2} \\ \text{BACKGROUND} \{ \boxed{4} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] \\ \text{NHD-DTR} \left[\begin{array}{c} \text{semi-integrated-phrase} \\ \text{PHON} \langle \text{Studenten schlafen lange} \rangle \\ \text{SS} \mid \text{LOC} \left[\begin{array}{c} \text{CAT} \mid \text{HD} \mid \text{MOD} \boxed{1} \\ \text{CONTEXT} \left[\begin{array}{c} \text{INFO-STRUCT} \boxed{2} \\ \text{BACKGROUND} \{ \boxed{3} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] \\
 \wedge \boxed{3} \neq \boxed{4}
 \end{array}$$

Figure 4: Example feature structure for constructions containing a semi-integrated clause

3.2 Clauses of sort *non-integrated*

To account for clauses of sort *non-integrated*, an approach to peripheral adverbials by Haegeman (1991) is adapted. Clauses of sort *non-integrated* are analyzed as

orphan constituents, which means that they are syntactically unattached.¹² Following Haegeman (1991), orphaned clauses serve to form the discourse frame against which the proposition expressed in the matrix clause is evaluated by providing additional background information. Hence, the modification relation is not established in syntax, but rather at the level of utterance interpretation. This can easily be implemented into an HPSG-based grammar by introducing phrases of sort *head-orphan-phrase* as subsort of *headed-phrase*, cf. fig. 5, and requiring that the CONTENT value of an orphan is unified with the BACKGROUND set of its head, while the MOD attribute is specified as *none*, cf. fig. 6.

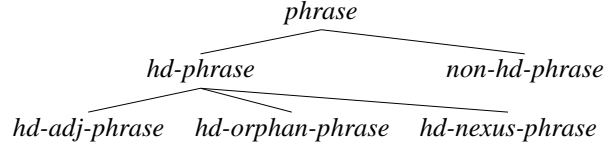


Figure 5: Partition of *phrase* w.r.t. HEADEDNESS

As depicted in fig. 6, the fact that an orphan is not included into the host's information structure is again grasped by restricting the value of the INFO-STRUCTURE attribute as it is stipulated that the INFO-STRUCTURE value of the orphan does not equal the INFO-STRUCTURE value of its host. Since an orphan also has illocutionary force of its own the BACKGROUND value of the head-daughter of phrases of sort *head-orphan-phrase* has to be different from the one of the non-head daughter, which represents the orphan.

$$\begin{aligned}
 \text{head-orphan-phrase} \rightarrow & \left[\begin{array}{l} \text{HD-DTR} \mid \text{SS} \mid \text{LOC} \left[\begin{array}{l} \text{CAT} \mid \text{HD } \textit{verb} \\ \text{CXT} \left[\begin{array}{l} \text{INFO-STRUC } \boxed{1} \\ \text{BACKGR } \{ \boxed{3}, \boxed{4} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \\ \text{NHD-DTR} \mid \text{SS} \mid \text{LOC} \left[\begin{array}{l} \text{CAT} \mid \text{HD } [\text{MOD } \textit{none}] \\ \text{CONT } \boxed{3} \\ \text{CXT} \left[\begin{array}{l} \text{INFO-STRUC } \boxed{2} \\ \text{BACKGR } \{ \boxed{5} [\textit{intend}], \dots \} \end{array} \right] \end{array} \right] \end{array} \right] \\
 & \wedge \boxed{1} \neq \boxed{2} \wedge \boxed{4} \neq \boxed{5}
 \end{aligned}$$

Figure 6: Restricting orphan constituents such as *non-integrated* clauses

Since *non-integrated* clauses are cross-classified as a subsort of *head-orphan-phrase*, they have to obey the restrictions for orphans. This analysis provides a vanilla account of the properties of *non-integrated* clauses as described in sec. 2.¹³

Fig. 7 gives an example feature structure for the sentence *Peter kommt zu spät, weil er hat keinen Parkplatz gefunden*. (‘Peter is late because he could not find a

¹²However, this does not mean that orphans are syntactically unconstrained, see Haegeman (1991).

¹³The fact that negation neither takes scope over *semi-integrated* clauses nor *non-integrated* ones can easily be implemented in the lexicon by restricting negation particles and negative verbs to clauses of sort *integrated*. Further, LP rules may be defined which limit clauses of sorts *semi-integrated* and *non-integrated* to final positions in a complex sentence structure.

parking space.’) The adverbial clause is marked as being of sort *non-integrated-phrase*. It does not syntactically modify its host since the value of its MOD attribute is instantiated as *none*. However, the CONTENT value of the orphan is inserted into the BACKGROUND set of the head, which is expressed by tag [3]. Tag [1] and [2] mark the information structure of each constituent and tag [5] and [6] the illocutionary force.¹⁴

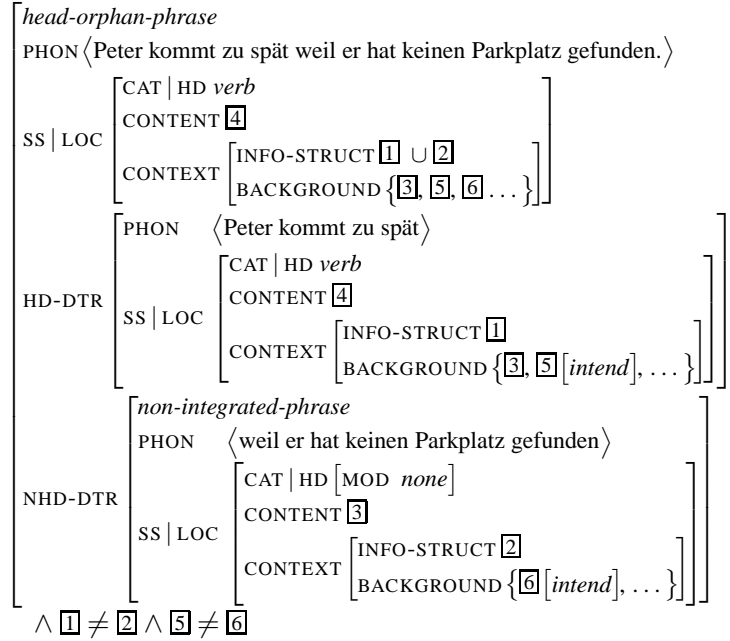


Figure 7: Example feature structure for constructions containing a non-integrated clause

The presented approach to non-integrated clauses has the advantage that the discourse-structural relation between these clauses and their hosts can be expressed without being forced to establish a syntactic relation as well.

4 Conclusion

Considering as example German, the present paper has investigated non-canonical clause linkage phenomena and has developed a constraint-based analysis accounting for the empirical fact that clauses need to be distinguished regarding their degree of integratedness into a potential matrix clause. It has been shown that the generally assumed twofold distinction between main and subordinate clauses (or root and embedded clauses) does not suffice to deal with the presented data. Moreover, it has been argued that the discussed linkage phenomena originate from syntactic,

¹⁴Tag [4] marks the semantic content of the whole construction which is projected from the head.

semantic and pragmatic properties of the clauses involved, and should hence be encoded in grammar. By partitioning objects of sort *phrase* in terms of a LINKAGE dimension and by constraining the CONTEXT value of these objects, the data are covered without any reference to a position of the finite verb. Additionally, non-integrated clauses are considered as ‘orphan’ constituents which are unattached in syntax, but provide the context for the interpretation of their host clause. Such an approach explains the empirical facts assembled in a straightforward way. Further research may show to what extent the proposed analysis can cope with similar phenomena in other languages.

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