6

Phrasal typology and the interaction of topicalization, wh-movement, and extraposition

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6.1 Introduction

Ever since Chomsky's "On Wh-Movement" (Chomsky 1977) it has been assumed that topicalization and wh-question formation can be analyzed as instances of the same operation. Leaving certain features aside, this proposal carries over to the analysis of unbounded dependency constructions in HPSG since structurally, topicalization does not differ from wh-question formation in the analysis suggested in Pollard & Sag (1994:157-163).[1] In the present paper, we challenge this assumption and suggest an alternative analysis of unbounded dependency constructions. Here, topicalization and wh-question formation are considered as structurally different at least in certain languages. They may, however, be structurally identical in other languages. This difference is empirically reflected in patterns of relative clause extraposition. As has been pointed out by Culicover & Rochemont (1990:28), an extraposed relative clause must not take an antecedent contained in a VP if the VP is topicalized but the relative clause is not.[2]

[1] It must be made explicit, though, that Pollard/Sag (1994) assume that these operations involve different combinations of attributes of the sign. Moreover, Pollard/Sag (1994) illustrate unbounded dependency constructions with topicalization cases and leave a detailed analysis of wh-question formation open. It is still a tacit assumption of this work that both wh-question formation and topicalization are syntactically realized through the Head-Filler Schema (Pollard/Sag 1994:164).

[2] Example (2) could be grammatical if the relative clause would take the subject as its antecedent. This is problematic, however, since the antecedent is a pronoun.

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(1) The governor said he would meet **a man** at the party **who was from Philadelphia**, and meet a man at the party who was from Philadelphia he did.

(2) *The governor said he would meet **a man** at the party **who was from Philadelphia**, and meet a man at the party he did who was from Philadelphia.

As is illustrated in (3), (4), and (5), the grammaticality distribution is the same if the topicalized phrase itself is the antecedent.[3]

(3) I like micro brews that are located around the Bay Area.

(4) **Micro brews that are located around the Bay Area**, I like.

(5) ***Micro brews**, I like **that are located around the Bay Area**.

Topicalization does not seem to pattern with wh-question formation in this respect. As the following examples show, an extraposed relative clause may take an antecedent that has been wh-moved. This observation is somewhat surprising if topicalization and wh-question formation are analyzed as instances of the same phrase structure schema.[4]

(6) Who$_i$ do you know [that$_i$ you can really trust]?

(7) Which argument$_i$ do you know [that$_i$ Sandy thought was unconvincing]?

One could assume that the contrast illustrated in (1) to (5) can be accounted for by considering the grammaticalized discourse functions of the dislocated phrases. In the ungrammatical cases in (2) and (5), the dislocated phrase can be considered a grammaticalized topic - hence the term topicalization. In the grammatical cases in (6) and (7), the dislocated phrases can be analyzed as the focus of the sentence. In section 6.2 below, however, we will show that such an approach is problematic. Instead, we will suggest that the contrast between (6) and (7) on the one hand, and (2) as well as (5) on the other hand, can be derived from the interaction of two assumptions. The **first assumption** concerns the typology of phrases in HPSG. Pollard & Sag (1994:391) assume that subjects are realized as subject daughters, and that topicalized phrases, wh-subjects, as well as wh-objects are realized as filler

In the examples given, we assume an association between the relative clause and the object, unless otherwise indicated.

[3]If the antecedent of the relative clause is the subject, and not the object, the construction is grammatical, as is witnessed in (i):

(i) Micro brews the men$_i$ mentioned yesterday [who$_i$ came from New York].

(ii) The men who came from New York mentioned micro brews yesterday.

[4]Following Sag (1997:462f.), we assume that *that* can be analyzed as a pronoun.

daughters. Contrary to this assumption, we assume that wh-moved object daughters and 'ordinary' subject daughters in English are specifier daughters, and not filler daughters, or subject daughters, respectively. Topicalized phrases, however, are analyzed as filler daughters. The different typologies are summarized in the table in (8).

(8) Comparison of phrasal typologies:

HPSG (Pollard & Sag 1994)		Present Paper	
SUB DTRS	FILLER DTRS		SPEC DTRS
subjects	wh-subs wh-objs top ph	top ph	subj wh-subj wh-obj
dislocated ±		lexically related ±	

The major difference between the typology suggested in Pollard & Sag (1994) and the present one is that in the former the dislocation of a phrase is the constituting property, while in the latter it is the question whether the phrase is related to a lexical head or not. We assume that if a dislocated phrase is related to a lexical head, it is analyzed as a specifier daughter. If a dislocated phrase is not related to a lexical head, it is analyzed as a filler daughter, which means that filler daughters are adjoined to phrases while specifier daughters are lexically selected.[5] This difference has important empirical ramifications. In particular, we can relate the constrast observed in (1) to (7) to the residual verb-second property of present day English: modifier extraposition from a dislocated phrase is grammatical if the dislocated phrase stands in a certain structural relation to a lexical head. Since it is the lexical relation which is relevant here, and not the property of being dislocated, the analysis can also be carried over to cases where extraposition seems to be a lowering operation, viz. in the case of extraposition from subjects in English as discussed in Culicover & Rochemont (1990:32ff.). This issue will be discussed in more detail in section 6.6. It is thus not the discourse function of the dislocated phrase but the syntactic realization of the phrase that introduces a crucial distinction here.

The **second assumption** concerns the association between an extraposed relative clause and its antecedent. Following Kiss (2002), we will assume that extraposed relative clauses are neither moved nor asso-

[5]Pollard/Sag (1994:363-371) assume that specifiers include a variety of categories, among them numerals in NP and numeral modifiers in PP. Although we do not provide an analysis for these constructions, we assume tacitly that all these constructions are not to be analyzed as specifiers in the sense used here. This issue will be taken up in more detail in section 6.6.

ciated with their antecedents through a 'movement simulation' feature, like EXTRA (cf. Keller 1995). Kiss (2002) assumes that extraposed relative clauses can be adjoined to a given phrase if the phrase contains a suitable antecedent. Such an antecedent can be deeply embedded in the phrase, but the agreement features of the phrase must be compliant with the agreement features of the relative pronoun. Since the association of the relative clause with its NP antecedent must take place in a local tree structure, so-called anchors mediate it. Anchors are introduced into the syntactic structure by nominal projections. They are projected through the set-valued non-local feature ANCHORS. The relative clause requires that the ANCHORS attribute of its syntactic sister contains at least one anchor that can be used for identification. In its relevant parts, the anchor is identical to the index of the nominal projection. It hence follows that the head of the nominal projection and the relative pronoun agree. The projection of anchors is subject to a condition requiring that all anchors become bound if the resulting phrase is an instance of the Head-Filler or Head-Specifier Schema. Hence, Kiss (2002) can account for the fact that relative clause extraposition is not constrained by the Complex Noun Phrase Constraint, but must still obey Upward Bounding. Extraposition is upward bounded, which means that - in terms of movement - an extraposed phrase must not cross an S'-node (cf. Ross 1967/86:174ff.).

These two assumptions interact in a crucial way. Kiss (2002) assumes that in head-specifier phrases, the head's anchors set contains the anchors of its specifier as well. In itself, this is a mere stipulation, but it yields the empirical consequences sketched above, since in a head-specifier structure, the anchors become available once the head has been introduced. Given that anchors mediate the relation between an extraposed relative clause and its antecedent in the present proposal, an extraposed phrase may be adjoined to a phrase that crucially does not contain the antecedent, but only the lexical head whose specifier the antecedent will be. This configuration does not only account for the contrasts given in (1)to (7) but also for the observation that subject-related extraposed relative clauses may be found inside VP, i.e. in a phrase which does not contain the antecedent.

The typology of phrases sketched here for English does not necessarily hold for other languages. In other words, there is nothing inherent in either topicalization or wh-question formation that requires topicalization to be an instance of the Head-Filler schema (Pollard & Sag 1994:164), and wh-question formation to be an instance of the Head-Specifier Schema (Pollard & Sag 1994:362), respectively. Hence, the analysis also accounts for the fact that a contrast between wh-

movement and topicalization does not show up in verb-second (V2) languages such as German, if V2 constructions are analyzed as instances of the Head-Specifier Schema. Grammatical cases of extraposition with topicalization and wh-movement are given in (9) and (10).

(9) Den Mann$_i$ hat sie gesehen, den$_i$ ich gestern getroffen hatte.
The man has she seen who I yesterday met had
'She saw the man that I had met yesterday.'

(10) Wen$_i$ hat sie gesehen, den$_i$ ich gestern getroffen hatte?
Who has she seen who I yesterday met had
'Who did she see that I had met yesterday?'

The following sections illustrate and elaborate the proposal. In section 6.2, we sketch a discourse-based account to the aforementioned contrasts and its problems. Section 6.3 briefly illustrates Kiss' (2002) analysis of relative clause extraposition. Section 6.4 discusses the interaction of extraposition with heads and specifiers. Section 6.5 presents the analysis of the contrast given above. Section 6.6 discusses the treatment of VP-internal subject-related extraposed relative clauses in the light of the present proposal and its implications for the structural relation between relative clauses and their antecedents. Section 6.7 offers an assessment of the conceptual foundations of the present proposal and summarizes the analysis.

6.2 A discourse-based analysis

As was suggested in the introduction, it seems worthwhile to explore whether the contrast exemplified above could be reduced to the discourse functions of the dislocated phrases.[6] In particular, one could assume that focused phrases must not appear in topic position (at least this seems to be forbidden in English clauses), and furthermore that a phrase which is related to an extraposed phrase is necessarily focused. Such a suggestion, however, exhibits a variety of problems once considered under closer scrutiny. Although it is correct that an extraposed phrase shows a focusing effect (cf. Rochemont & Culicover 1990:64), this does not imply that the antecedent of an extraposed phrase necessarily has to be focused as well. To the contrary, Rochemont & Culicover (1990:64) show that the antecedent of an extraposed phrase can even be a topic, while the extraposed phrase is still focused. This is illustrated in the question-answer pair in (11), where capitalization indicates stress.

(11) Q: Did Mary meet any soldiers at the party?
A: Yeah, she met a soldier at the party that she really LIKES.

[6] I would like to thank an anonymous reviewer for raising this issue.

If a soldier in (11) can be classified as a topic, or at least as a clear non-focus, as suggested by Rochemont & Culicover (1990), why is it still impossible for such a phrase to appear in topic position? Example (12) is crashingly ungrammatical, even if it is given as an answer to the question in (11).

(12) *A soldier she met at the party that she really LIKES.

With the ungrammaticality of (12), however, a discourse-based analysis of the contrast exemplified above collapses since such an example would have to be classified as grammatical. We will thus refrain from a discourse-based analysis and instead present a syntactic approach to the contrast in (1) to (7).[7]

6.3 Extraposition as adjunction

The analysis of relative clause extraposition presented in Kiss (2002) is based on the following hypotheses:[8]

- A relative clause can be syntactically adjoined to all kinds of major phrases (D/NP, PP, VP).
- A relative clause semantically modifies the semantic contribution of a phrase that is contained in the phrase to which the relative clause has been adjoined.

So-called anchors mediate the modification. For the present purposes, we may assume that an anchor is identical to the index of a sign.[9] An anchor is introduced by nouns and verbs, and is projected through a set-valued non-local attribute called ANCHORS. The projection is constrained by the following condition:

(13) Anchor Projection Principle:
The INHERITED|ANCHORS value of a headed phrase consists of the union of the INHERITED|ANCHORS values of the daughters less those anchors that are specified as TO-BIND|ANCHORS on the head daughter.

[7] There is a further problem with a discourse-based approach: Even if such an analysis were tenable, it would remain unclear how it could be integrated into HPSG. I admit though that this is less a problem of a discourse-based approach and more one of a theory which started out as an all-integrating approach to natural language.

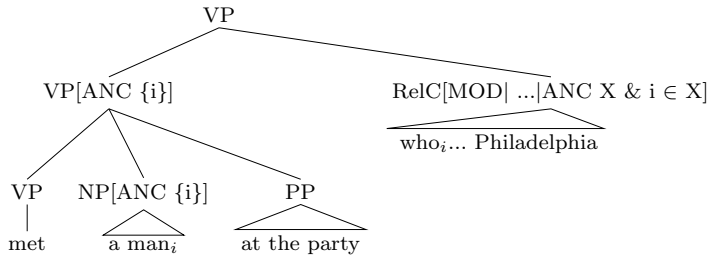
[8] For a detailed account, the reader is referred to Kiss (2002).

[9] This identification immediately accounts for the requirement that a relative pronoun and its antecedent have to agree. The semantic representations used in Kiss (2002) are based on Minimal Recursion Semantics (MRS, cf. Copestake et al. 1995). Since handles in MRS model semantic subordination, an anchor actually consists of an index and its associated handle. This is irrelevant for our present purposes.

In the following examples (14) and (15), the anchor of the object is represented through its index i. It is the effect of (13) that anchors project freely in a syntactic structure, as long as they are not specified as TO-BIND on the head daughter of a phrase. As for the internal structure of relative clauses, the present analysis stays in close correspondence to the analysis developed in Pollard & Sag (1994, chap. 5). There are two crucial differences though, as already mentioned above. First, the relative clause's MOD attribute is not categorially restricted. Hence a relative clause may adjoin to an NP or to a VP or to other phrases.[10] Second, the semantic identification requirement is mediated through the ANCHORS attribute. The identification requirement MOD|... |ANC X & i ∈ X is to be read as follows: the modified phrase must have an ANCHORS value X and this value must contain a compliant anchor i as one of its elements. It is important to realize that this identification requirement is completely independent of a possible extraposition of the relative clause, i.e. the identification requirement accounts both for the extraposed and the non-extraposed case, as can be illustrated in (14) and (15). In (14), the relative clause is adjoined to the VP. Since the VP contains the compliant anchor i, which is inherited from the object NP a man, the structure corresponds to the identification requirement of the relative clause, and hence the adjunction is licensed.[11]

(14) a. John [$_{VP}$ met [$_{NP}$ a man] at the party who was from Philadelphia].

b.



In (15), the relative clause is directly adjoined to the object NP (we have omitted the PP here, for reasons of perspicuity). But since the object NP contains the very anchor of its head noun, the identification

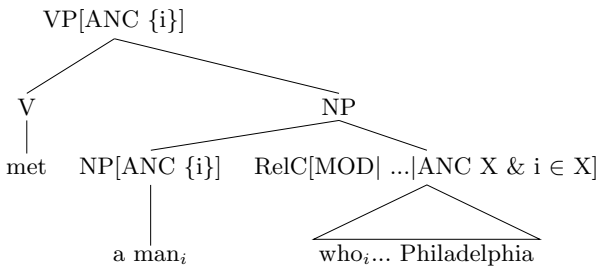
[10] Kiss (2002, section 2.3) shows that an adjunction of relative clauses to phrases other than NPs is empirically justified, unless one wants to pursue an analysis based on short distance extraposition.

[11] Please note that for expository purposes we have shown only the anchor that will be bound by the relative clause. Depending on the PP and the RelC in (14), the RelC could even be associated with the NP complement of the preposition.

requirement of the relative clause is again met.[12]

(15) a. John [$_{VP}$ met [$_{NP}$ a man who was from Philadelphia]] at the party.

b.



The Anchor Projection Principle in (13) is reminiscent to the Nonlocal Feature Principle of Pollard & Sag (1994:164). If an anchor is specified as TO-BIND, its projection is cancelled. We assume that the Head-Filler Schema (as given in Pollard & Sag 1994:164) and the Head-Specifier Schema (as given in Pollard & Sag 1994:362) are constrained to the effect that all anchors of the daughters are specified as TO-BIND—ANCHORS. English clauses are the result of either of the two schemata. It follows immediately that relative clause extraposition is upward bounded, since the Anchor Projection Principle blocks a further projection of the anchors once a structure has been built by either schema. This idea has an interesting but also seemingly unwanted consequence, once we give up the idea that the subject of an English clause is realized as a subject daughter and instead is realized as a specifier daughter, as suggested in (8). If an anchor is cancelled once a specifier daughter is realized, how can a subject related extraposed relative clause be realized at all? To answer this question, let us consider the status of traces with respect to the suggestions already given.

6.4 Traces, head specifier constructions, and extraposition

To exclude ungrammatical examples like (16) and (17), where a phrase has been topicalized but a relative clause is realized in a position where it modifies the trace of the topicalized phrase, Kiss (2002) assumes that

[12] Although it already follows from the Anchor Projection Principle in (13), it should be stressed that the anchor of the NP is not cancelled after an identification with the relative clause takes place in (14) and (15). The empirical reason for not immediately cancelling anchor projection after an identification took place stems from the observation that an anchor may be used more than once, as can be witnessed in (i).

(i) John met a man at the party with blond hair who was from Philadelphia.

traces do not contain anchors.[13]

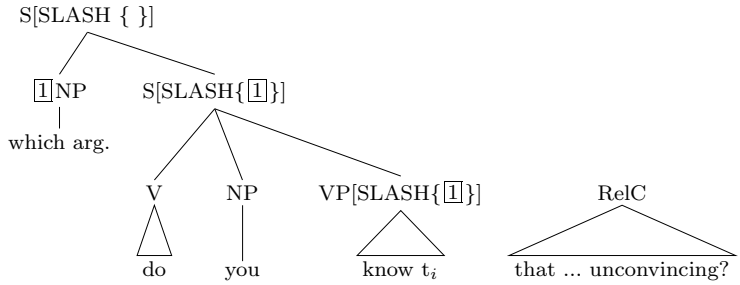
(16) *[Which man]$_i$ did you meet [t$_i$ who was from Philadelphia] at the party?

(17) *[Den Mann]$_i$ hat sie [t$_i$ den ich gestern traf] gesehen. The man has she who I yesterday met seen

This assumption is not only empirically justified by examples like (16) and (17), but also conceptually. Anchors belong to the NONLOCAL features. Since a trace and its antecedent only share their LOCAL features, the presence of an anchor in a trace would not be transmitted to its antecedent. But if a trace does not contain anchors, it remains a mystery how the grammatical examples in (6), (7), (9), and (10) could be derived in the first place. Consider as a first illustration an analysis of example (7) in (18).

(18) a. Which argument$_i$ do you know [that$_i$ Sandy thought was unconvincing]?

b.



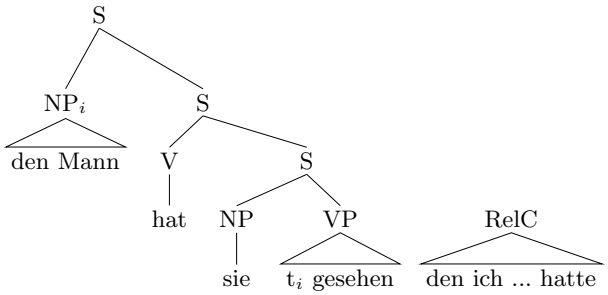
The problem is that it remains rather obscure to which phrase the relative clause should be adjoined. Since traces do not contain anchors, the identification requirement cannot be met by adjoining the relative clause to the VP or to the lower S. Also, the relative clause cannot be adjoined to the higher S since the Anchor Projection Principle requires that all anchors be cancelled as a result of the application of the Head-Specifier Schema. Consequently, it looks as though the analysis suggested so far cannot even account for rather simple cases of extraposition from wh-phrases. Consider as a further illustration example (9) in (19).[14]

[13] The same result could be achieved by assuming that traces do not exist (cf. Sag 1997). As has been pointed out by Kiss (2002), it remains unclear how so-called reconstruction effects are captured in a traceless analysis.

[14] Nothing will be said here about the details of the verb second construction in German. Pollard (1996), e.g. assumes that a verb in second position is a verb with a [INV +] specification. Following Borsley (1989), Kiss (1995) assumes that the verb

(19) a. Den Mann$_i$ hat sie gesehen, den$_i$ ich gestern getroffen hatte.

b.

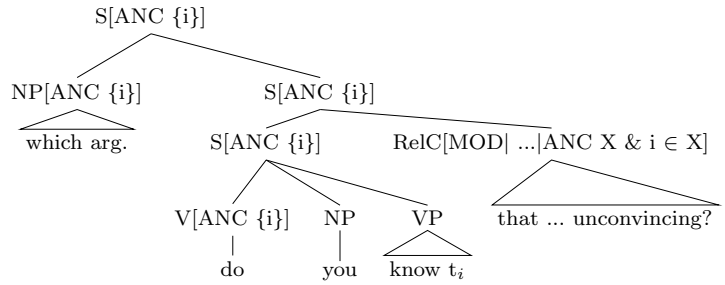


In (19), the same considerations apply: the relative clause cannot adjoin to VP, since the trace in VP does not count as an antecedent. For the same reason, it cannot be adjoined to the lower S nodes either. What is more, it cannot adjoin to the highest S node, since the highest S node does not contain any anchor.

Kiss (2002) solves this problem by applying Pollard and Sag's analysis of tough constructions (1994:166-171) to V2 constructions including English wh-constructions, which are instances of residual V2. Kiss assumes that a verb in second position contains a lexical TO-BIND—SLASH specification. It cancels the SLASH projection of its NP or VP complement and further selects the SLASHed constituent as its specifier. Building on this idea, Kiss (2002) suggests that the anchors of a specifier are also present in the lexical head that selects the specifier. As a consequence, the following analysis of example (7) emerges.

(20) a. Which argument$_i$ do you know [that$_i$ Sandy thought was unconvincing]?

b.

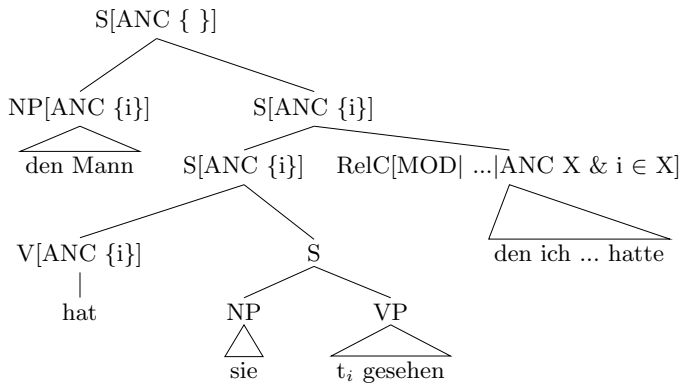


in second position is actually the result of a dislocation (simulated through feature percolation). We follow Kiss' analysis here since it allows a uniform treatment of subject and object extraction. With respect to English, we assume the clause structure given in Pollard/Sag (1994).

Correspondingly, the example (9) can be analyzed by adjoining the relative clause to the lower S node, as is illustrated in (21).

(21) a. Den Mann$_i$ hat sie gesehen, den$_i$ ich gestern getroffen hatte.

b.



The lexical specification of a finite inverted English verb in (22) shows the crucial relationship between the NONLOCAL|INHERITED| ANCHORS value of the verb and its specifier (SPR). The anchors of the specifier are set-unioned with the anchors of the head itself, thus making the anchors of the specifier available once the head has been introduced. A German verb in second position would show the same representation, i.e. the anchors of the topicalized phrase become available once the verb in second position has been realized. There are differences, though, between inversion in English and German, which, however, are tangential to the present discussion and will hence be ignored.[15]

(22) Lexical specification of English inverted verbs:

[15] An association of the relative clause with the subject is blocked since the gender of the subject is not compliant with the gender of the relative pronoun. We can thus safely ignore the anchor of the subject. Similarly, the anchors of the subjects are ignored in the analysis of (5) and (7).

$$\left[\begin{array}{l} \text{LOC}\,|\,\text{CAT}\left[\begin{array}{l} \text{HEAD } \textit{verb}\left[\text{INV } +\right] \\ \text{SPR}\left\langle\left[\begin{array}{l}\text{LOCAL } \boxed{1} \\ \text{NONLOCAL}\,|\,|\,\text{ANCHORS } \boxed{2}\end{array}\right]\right\rangle \\ \text{COMPS}\left\langle \boxed{3}\text{NP, VP}\left[\begin{array}{l}\text{SPR}\left\langle\boxed{3}\right\rangle \\ \text{SLASH}\left\{\boxed{1}\right\}\end{array}\right]\right\rangle \end{array}\right] \\ \text{NONLOCAL}\left[\begin{array}{l}\text{INH}\,|\,\text{ANCHORS } \boxed{2}\cup\boxed{4} \\ \text{TO-BIND}\,|\,\text{SLASH}\left\{\boxed{1}\right\}\end{array}\right] \end{array}\right]$$

As is illustrated in (22), the complement's SLASH is identified with the specifier of the verb. In addition, the anchors of the specifier are set-unioned with the anchors of the verb itself. Hence, they become available once the verb has been introduced into the syntactic structure. The representation in (22) reveals another property of the present analysis: the subject of a verb is not represented through a SUBJ attribute but is also considered a specifier. Hence, we assume that not only the anchors of a dislocated phrase, but also the anchors of subjects become available once the verb is introduced. We are now in the position to offer an answer to the question raised at the end of section 2. A subject-related extraposed relative clause may (in fact must) be realized inside VP since the subject's anchors are present in the verb already. This idea will be explored more deeply in section 5.

6.5 Analyzing the data

The basic tenets of the present analysis can be summarized as follows: Extraposed relative clauses are related to their antecedents through anchors and anchor projection. Anchors are discarded if a phrase is built by the Head-Specifier Schema or the Head-Filler Schema. In a Head-Specifier Schema, the lexical head bears the anchors of its specifier (apart from its own anchor).[16]

[16] Sag (1997:466) mentions cases like (i), where the relative clause can only be related to the whole wh-phrase and not to a part of it.

(i) [Which author$_i$'s book]$_j$ do you know that*$_i$/$_j$ you like?

The ungrammaticality indicated in (i) should not be derived by blocking NP-internal antecedents of a relative clause. As has been discussed by Haider (1996) and Kiss (2002) among others, a general ban against NP-internal antecedents of relative clauses would lead to an undergeneration, since relative clause extraposition is well-known to violate the CNPC (Ross 1967/86). It seems that the ungrammaticality of (i) is related to the fact that the NP-internal antecedent is a specifier itself. Kiss

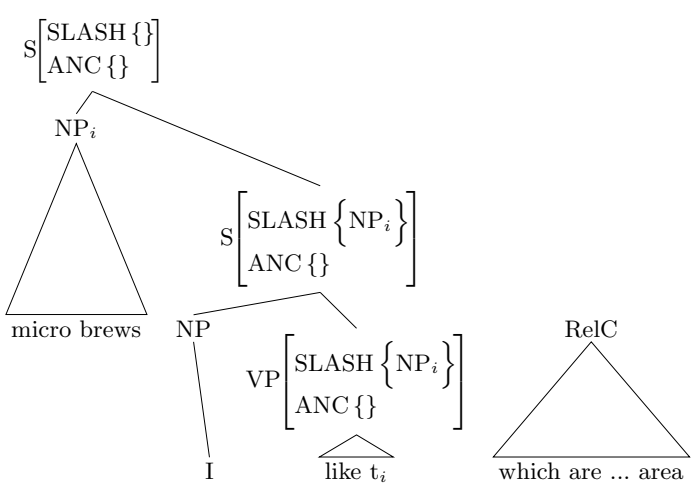
Subjects are specifiers of non-inverted finite verbs. The specifier of an inverted verb originates as SLASH of its complement.[17] Although superficially the bracketed part of (2) resembles the structure of example (21), it becomes obvious under closer scrutiny that (2) resembles (19) more than (21). In the analysis of (2), the topicalized VP is adjoined to another phrase as an instance of the Head-Filler Schema. A filler daughter differs from a specifier daughter in that the former is not related to a lexical head. Such a lexical head, however, would be required to make the anchors of the 'moved' phrase available for the extraposed relative clause. Hence, (2) is excluded because the extraposed relative clause neither finds an antecedent in the VP nor in the S projections.

(2) *The governor said he would meet a man at the party who was from Philadelphia, and [[$_{VP}$ meet a man at the party]$_i$ he did t$_i$ who was from Philadelphia].

Let us now turn to the analysis of (5). Just like (2), example (5) is an instance of the Head-Filler Schema. The topicalized constituent is adjoined to a phrase which does not have a lexical head.

(5) a. *[$_S$ [$_{NP}$ Micro brews]$_i$ [$_S$ I like t$_i$]] which are located around the Bay Area.

b.



(2002) does not provide an analysis of NP-internal specifiers, but generally assumes that only N' parts of an NP project anchors.

[17] We assume that the subject in inverted structures is actually a subject daughter, as suggested in the initial formulation of the Head-Subject-Complement-Schema in Pollard/Sag (1994:388).

As in the analysis of (2), it would only be possible to adjoin the relative clause to the VP or lower S and hence modify the subject, but not to adjoin the relative clause to VP or S and thus to modify the topicalized object. This conclusion follows since the anchor of the object is not present in VP or S. The relative clause cannot be adjoined to the higher S, since according to the Anchor Projection Principle, the resulting S does not contain any anchor.

We have already illustrated that the superficially similar example (7) does not share its structure with example (5). While example (5) is the result of an application of the Head-Filler Schema, example (7) is an instance of the Head-Specifier Schema. These two schemata differ crucially in that the latter allows an identification of the non-head daughter's anchors, but the former does not.

6.6 VP-internal subject-related relative clauses

The present analysis is not the first one to assume a strictly non-movement analysis of extraposition. Notable fore-runners are the proposals by Wittenburg (1987) and Culicover & Rochemont (1990). The present proposal and its two predecessors make rather different predictions about the structural relationship between an extraposed relative clause and its antecedent. These predictions can be summarized as follows. The present proposal assumes with Kiss (2002) that the extraposed phrase must in most cases be configurationally superior to its antecedent. There is a single exception, viz. if the antecedent is a specifier, the antecedent can be configurationally superior to the extraposed phrase, as illustrated in the previous section. Taking a rather different stance on this issue, Wittenburg (1987) proposes that the antecedent must be configurationally superior to the extraposed phrase in all cases. This position is empirically problematic, as can be witnessed by considering the following example:

(23) John talked to the *brother of the man* yesterday who had given him two pillows.

In (23) the relative clause can take the NP the brother of the man or the embedded NP the man as its antecedent. While the former NP can be realized in a configurationally superior position, this is impossible for the latter NP. In other terms, the embedded NP does not c-command the extraposed relative clause and hence cannot be classified as being configurationally superior to it. Wittenburg would thus predict that example (23) is in fact unambiguous with repect to the antecedent of the relative clause. Culicover & Rochemont (1990) actually assume a middle position. Their proposal allows that either the extraposed relative

clause is configurationally superior to its antecedent or the antecedent is superior to the extraposed relative clause. It is interesting to see where the disjunctive formulation of this proposal has its origin. Culicover & Rochemont (1990:32f.) observe that subject-related extraposed relative clauses can be realized inside VP. They offer the following empirical observations to justify their assumption. First, as is illustrated in (24), a subject-related extraposed relative clause can be realized to the left of the complex adverbial *as quickly as possible*. According to Culicover & Rochemont (1990), this adverbial marks the right-hand side of the VP, and hence, material which is realized to its left must be realized inside VP. Second, as is illustrated in (25), elliptical constructions allow a construal where an elided modifier may modify both subjects in a conjunction.

(24) Some women came in who were from Chicago as quickly as possible.

(25) A man with blond hair came in, and a woman did too.

Hence in (25) we find a reading where with blond hair modifies both the first and the second subject. In the present proposal, the examples given in (24) and (25) can be covered without resorting to a disjunctive constraint. As we have illustrated, the anchors of a specifier become available once the lexical head is realized on which the specifier is dependent. Again differing from the analysis in Pollard & Sag (1994), we assume that subjects are also specifiers. As a consequence, a subject-related extraposed clause is not only predicted, but actually forced to appear inside VP. This is so because the anchors of the subject are cancelled after the subject has been realized as a specifier daughter. It follows from the same considerations that object-related extraposed relative clauses must appear inside VP. They can only appear outside VP if the object is realized as a specifier daughter, i.e. in the case of wh-question formation. In all other cases, the anchor of the object is cancelled together with the anchor of the subject, once the subject has been realized. The present proposal thus accounts for two observations made in Culicover & Rochemont (1990). First, object-related extraposed relative clauses must appear inside VP because they can find a compliant anchor only here. There is one notable exception, depending on whether a dislocated object is realized as a filler or as a specifier daughter. Only in the latter case, an extraposed relative clause can adjoin to the phrase which contains the lexical head selecting for the specifier, as was discussed in sections 6.4 and 6.5. Second, subject-related relative clauses also must appear inside VP, which accounts for the observations reported in (24) and (25). We thus can refrain from a

disjunctive constraint on the realization of extraposed relative clauses.

Subjects actually show a behavior similar to other specifiers, and thus justify the move to declare them specifiers themselves. In particular, wh-phrases can be realized in subject position or in dislocated positions. Chomsky (1986:48ff.) has suggested that English subject wh-phrases are actually realized in the same position as subject non-wh-phrases. From the perspective of a typology of phrases which distinguishes subjects from other specifiers, as in Pollard & Sag (1994:391), this is a surprising result. In the present analysis, this result is much less surprising, since both subjects and dislocated objects occupy a specifier position. We would thus assume that an example like (26) does not show a dislocation of the wh-element at all. Instead, it is realized in 'subject' position, where a subject of a verb is analyzed as its specifier.

(26) I wonder who saw Kim.

It is also well known that wh-phrases may appear in indirect questions, although indirect questions are not lexically headed in English and German, as illustrated in (27).

(27) I wonder whom she saw.

A tentative proposal would be to assume that indirect questions are headed by an empty element, hence the relevant structure of (27) would be as given in (28), where e indicates an empty head, the specifier of which would be the wh-phrase.

(28) I wonder [[who] [*e* she saw]]

This empty element would behave exactly like an auxiliary verb in English or a verb in second position in German. Independent justification for empty heads in indirect questions has been provided in Bayer (1984) for Bavarian. An 'empty head' analysis follows the basic tenets of the analysis of relative clauses in Pollard & Sag (1994), which however has recently been critized in Sag (1997) and Sag & Ginzburg (2001). Although we cannot currently provide an exact analysis of interrogative clauses, it would be interesting to explore the consequences of the present proposal for such an analysis.

6.7 Conceptual assessment

While an extraposed relative clause can be related to a 'wh-moved' phrase, it cannot be related to a topicalized phrase. The reason is that the latter is adjoined to a phrase, but the former is realized as a specifier of that phrase. We have offered a syntactic account for the contrast between topicalization and wh-movement in English, and also for the non-contrast between these two constructions in German. This account

relies on the hypothesis that in English, two different structures have to be assumed for topicalization and question formation, while in German topicalization and question formation pattern alike. English topicalization structures are analyzed as being headless, i.e. as not having a lexical head. Since a local relationship between a head and the topicalized phrase cannot be established, a topicalized phrase may not serve as the antecedent of an extraposed phrase. It should be apparent that the analysis suggested relies on a structural difference between sentences with and without inverted verbs. Kathol (2000) has suggested that the structure of German verb final clauses is identical - in the pertinent respects - to German verb second clauses. Transferring his approach to English, one would come to the conclusion that inverted clauses are not structurally different from non-inverted ones. If this conclusion were drawn, however, the contrast in (1) to (7) would remain mysterious. We thus suggest that the present approach is not only descriptively adequate in offering an analysis of the aforementioned contrasts, but in addition makes substantial claims about the structural representation of clauses. We assume that the contrast given is a structural one, i.e. a contrast that can be reduced to different structures of superficially similar clauses.

From a conceptual point of view, we have opted for a typology of phrases which particularly turns subjects into specifiers. Such a move cannot be criticized by pointing out that the notion specifier already has an inherent definition in HPSG, a definition which is possibly at odds with the very notion of a subject itself. But this is actually not the case. The only clear definition of a specifier in HPSG is given through the features which are required to represent a specifier, viz. SPR and SPEC. The class of elements which are considered specifiers in Pollard & Sag (1994) is actually a mixed bag which seems to correspond to the classification of specifiers for English in Jackendoff (1977:103-165). This classification does not rely on an intrinsic property and hence becomes somewhat arbitrary. For many of the elements which are classified as specifiers in Pollard & Sag (1994, chap. 9.4), an alternative analysis suggests itself, e.g. a DP analysis for determiners (cf. Netter 1994).

It should be mentioned though that some conceptual and empirical arguments are presented in Pollard & Sag (1994) to show that certain elements can be carved out as specifiers. One assumption is that a specifier lacks the potential to be a semantic argument (Pollard & Sag 1994:359).[18] But this conclusion does not hold for many elements which

[18] Pollard/Sag (1994:359) also offer control and raising as a distinguishing property: subjects are open to control and raising while the class of elements they call

should be analyzed as specifiers, e.g. for possessives, for specifiers of AP, and of course not for ordinary subjects if these are VP specifiers.

Two empirical arguments against equating subjects and specifiers are presented in Pollard & Sag (1994:359f.). First, Pollard and Sag observe that predicative nouns may have a subject as well as a specifier, as illustrated in (29).

(29) We consider *John* an idiot.

There are various problems to be noted here. To begin with, it is rather unclear that the determiner has to be analyzed as a specifier. Alternatively, as already noted, one could assume that the determiner heads the whole phrase. What is more, the status of John as a subject is dubious as well. This can be witnessed by comparing (29) with (30).[19]

(30) I considered him Cicero.

It strikes me as rather strange that a proper noun should have a subject. Finally, this argument rests on the assumption that it is illicit for any predicate to have more than one subject. Although this idea might be correct, it does not predict anything about the multiple occurrence of specifiers. Since we have not claimed that specifiers are subject, but that subjects are specifiers, showing that more than one subject is intenable does not affect our argument.

The second empirical argument concerns the absolutive construction, where again a subject and a specifier may co-occur. Again, this can only be considered an argument as long as one assumes that a given element may have at most one specifier. Although this assumption is a tacit building block of many analyses of specifier constructions in generative grammar, it has recently been given up by Chomsky (1995:341ff.).

Pollard & Sag (1994:359ff.) argue against the assumption that specifiers are subjects. It should be clear that this position is not defended here either. As Pollard & Sag (1994:359) point out: "We will argue in favor of a ... position ... that specifiers ...

should be regarded in terms of a grammatical relation distinct from subject." Such a criterion of distinctness can be met if we assume that subjects form a subset of the class of specifiers. We can thus explain

specifiers is not. But Pollard/Sag (1994:359fn19) also note that such a property does not account for possessor raising, except if one assumes that possessors are not specifiers but subjects.

[19]Here I am relying on the grammaticality judgments of Bob Borsley and Bob Levine. Bob Levine also points out that although he finds (30) grammatical, he considers the following example to be ungrammatical.

(i) *After close examination, I find him Tully.

the common properties of subjects and other specifiers and still keep the two apart.

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