

The Prosody of Topicalization¹

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Abstract

Because of the elusive nature of pitch accents and prosodic phrasing, the role of prosody has been neglected too often in the description of the syntax-phonology interface. This paper shows that the syntactic structure of German sentences is shaped by the formation of prosodic phrases, and that many puzzles are solved if prosodic phrasing and accents are systematically considered in formal grammar. Some types of topicalization, like contrastive topicalization and split constituents, are motivated by the need to separate two accents which would be adjacent in an unmarked word order. The sentence has now two different intonation phrases, with the fronted constituent bearing an accent equal in strength to the preverbal focus one. The proposal is couched in an optimality theoretic framework, allowing direct interactions between prosody and syntax.

1 Introduction

In German, the language under consideration in this paper, topicalization is related to a special phonological structure. A topicalized constituent is located at the very beginning of a sentence where it has a prominent rising accent on its accented syllable and where it is separated from the rest of the sentence by a boundary tone, or even by a short break (see for instance Büring 1997 Jacobs 1997 and Féry 1993). In this paper ‘topicalization’ is understood as a syntactic and prosodic operation on constituents, and ‘topic’ as the pragmatic or semantic information structural content associated with topicalized constituents. From the syntactic perspective, the finite verb of a main clause is located in the second position of the sentence, and the prefield has to be filled. It is thus a natural consequence that a constituent in the prefield is not necessarily topical. Nominative arguments, dative arguments of passive and psych verbs, temporal adverbs, sentence level adverbs, etc. are often the first constituents of the sentence by virtue of being the ‘highest’ constituent of their clause (see below). The present paper focuses on the pre-field elements which are topical and which have been topicalized by a syntactic operation. It suggests that true topicalization has a prosodic origin. From the point of view of the prosody, the motor of topicalization is first the need to fulfill a constraint NOCLASH which prohibits adjacent accents, and second the need to realize a rising intonation on a constituent in order to express its topical character. This is why elements with a pragmatic topic land in the first position of the sentence, rather than somewhere else.

The next section introduces the theoretical framework of the paper. The optimality-theoretic approach to the syntax-prosody interface leans on a proposal developed in Féry & Samek-Lodovici (2006). Section 3 introduces different kinds of topics and topicalizations and shows that the syntactic structure of ‘contrastive’ topics, as opposed to ‘stylistic fronting’ or ‘formal movement’ (Fanselow 2002, Frey 2004) is reflected in the prosody. Section 4 discusses split constructions in which a noun is left-dislocated. In both contrastive topicalizations and split

constructions, the need to separate two pitch accents corresponding to two discourse structural properties can be considered as the motivation for the syntactic construction.

2 Theoretical framework

Féry & Samek-Lodovici (2006) propose an optimality-theoretic approach to the syntax-prosody interface (see also Prince and Smolensky 1993, McCarthy & Prince 1993 for Optimality Theory and Truckenbrodt 1995, 1999, Selkirk 2000, Büring 2001, 2003b, Samek-Lodovici 2005 and Szendrői 2003 for OT approaches to the syntax-prosody interaction). The prosodic structure of English sentences is shaped by constraints pushing phrasal and sentential accents as far to the right in their prosodic domain as possible (1a-b), reproducing the effects of the Nuclear Stress Rule (Chomsky & Halle 1968). The unique lexical head of a maximal projection is expected to be associated with a pitch accent, and as a result, to be the head of a prosodic domain (2). The typical head-argument stress pattern, with a pitch accent on the argument but none on the head, is a consequence of this constraint, see Gussenhoven (1992), Selkirk (1984), Cinque (1999), Büring (2001) and others for different proposals to this effect. In (3), constraints are formulated which restrict the number of prosodic constituents to a minimum.²

- (1) a. HP: Align the right boundary of every P-phrase with its head.
 b. HI: Align the right boundary of every I-phrase with its head.
- (2) STRESSXP: Each lexically headed XP must contain (maximally) one phrasal stress. ('Phrasal stress' refers to the head of a P-phrase.)
- (3) a. *P-PHRASE: No phonological phrase.
 b. *I-PHRASE: No Intonation phrase

The effects of these constraints on the prosodic phrasing and placement of accents are comparable in German and in English, and they are illustrated in Table 1 with the German example (4), understood as a whole-focused, all-new sentence.

- (4) $\left(\begin{array}{c} \\ \end{array} \right) I$
 $\left(\begin{array}{c} \\ x \end{array} \right) \left(\begin{array}{c} \\ \end{array} \right) P$
Sie hat heute morgen Rosen gekauft.
 she has today morning roses bought

Table 1: [Sie hat heute morgen Rosen gekauft]_F

	STRXP	*P-PHR	HI	HP	*I-PHR
a. \mathcal{F} ((x) I (x)(x) P Sie hat heute morgen Rosen gekauft		**		*	*
b. ((x)(x)(x) I (x)(x)(x) P Sie hat heute morgen Rosen gekauft		***!		*	*
c. ((x) I (x) P Sie hat heute morgen Rosen gekauft	*!	*		*	*
d. ((x) I (x)(x) P Sie hat heute morgen Rosen gekauft	*!	**			*
e. ((x) I (x)(x) P Sie hat heute morgen Rosen gekauft		**	*!	*	*

Candidate (a) in Table 1, with two P-phrases and one I-phrase, fulfills the constraints best. This candidate violates HP since the head of the prosodic constituent formed on the direct object plus the verb is not rightmost but this violation is forced by the combined effect of STRESSXP and *P-PHRASE. STRESSXP requires that lexical heads are heads of prosodic constituents, and *P-PHRASE restricts the number of P-phrases to a minimum. It guarantees that no phrase is formed to the sole effect of fulfilling HP. HP, as well as HI, only controls the location of the accent in demanding that it is as far to the right in the domain under consideration as possible. The accent on *Rosen* is enough to fulfill STRESSXP with respect to both the NP *Rosen* and the VP *Rosen gekauft*. An additional accent on the verb, as in candidate (b), implies one more violation of *P-PHRASE. The ranking between STRESSXP and *P-PHRASE is crucial, as can be seen from candidate (c). This candidate has only one phrase and thus does better on *P-PHRASE than candidate (a). But crucially, it violates STRESSXP whereas candidate (a) does not: *heute morgen*, a syntactic maximal projection, has no accent. Candidate (d) also fulfills HP better than (a) and (b), but is eliminated by high-ranking STRESS-XP, because not all syntactic phrases have a corresponding prosodic head: the NP *Rosen* has none. And finally candidate (e) entails a gratuitous violation of HI. In short, this tableau illustrates that STRESSXP must be higher-ranking than the other constraints, and that *P-PHRASE must be higher ranking than HP and HI, but lower ranking than STRESSXP. The ranking STRESSXP >> *P-PHRASE >> HI, HP >> *I-PHRASE is thus partly established. The constraint *I-PHRASE is relatively low-ranking. It should be clear that adding an IP in (4) does not ameliorate the optimal candidate. There is no evidence that HP and HI have to be ranked relatively to each other. These two constraints do not interact. The remaining of the ranking will be established below, in further tableaux.

The approach developed in Féry & Samek-Lodovici (2006) relates pitch accents directly to the discourse structure of English utterances and differs in this respect from Selkirk's (1995) model and also from Schwarzschild's (1999) improvements to Selkirk in giving up projections of F-marks. Selkirk requires the association of pitch accents with F-marks which are allowed to project higher in the syntactic tree according to two projection rules. First, F-marking of the head of a phrase licenses the F-marking of the phrase, and second, F-marking of an internal argument

of a head licenses the F-marking of the head. These rules, though very influential, have been shown to be too restrictive by Schwarzschild (1999) and Büring (1997, 2003b), who demonstrate that if heads and internal arguments have to be unstressed by virtue of being discourse given, a specifier, adjunct or any other element can be the accent bearer of a larger focus domain. Selkirk's rules, however, prohibit the projection of an accent from such constituents. Schwarzschild proposes replacing the projection rules by free assignment of F-marks. He also limits their effect by positing a series of constraints. One of these is GIVENNESS (in (5a)), positing that a constituent that is not F-marked is given. As a consequence, all new constituents are F-marked, and constituents which are F-marked can be new or given. Another constraint introduced by Schwarzschild is AVOIDF, formulated in (5b), which limits the occurrence of F-marks.

- (5) a. GIVENNESS: A constituent that is not F-marked is given.
- b. AVOIDF: Do not F-Mark.

In Schwarzschild's example (6), the VP is not given since it is not mentioned in the previous discourse, nor is it entailed by the previous discourse and crucially, neither the verb *praised* nor the object *her brother* are given (see the precise definition of givenness in Schwarzschild 1999). The location of the pitch accent is decided by an extra constraint which posits that a head is less prominent than its internal argument(s). In (7), both *praised* and *him* are given by virtue of being introduced in the context in curly brackets, but the fact that she praised *John* is not given, so that the VP is not given. Constraint (5a) cannot choose between a candidate in which the whole VP is F-marked, as in (7b), and one in which only *him* is F-marked, as in (7a). The choice between the two is decided by AVOIDF, which chooses (7a) because it has fewer F-markings than (7b).³

- (6) {What did Mary do?}
A: She [praised_F [her BROTHER]_F]_F
- (7) {Who did John's mother praise?}
a. She praised [HIM]_F
b. She [[PRAISED]_F him]_F

Problematic for both Selkirk's and Schwarzschild's approaches, as well as others like Büring (2003b), are examples like (9) from Rooth (1992), (10) from Neeleman & Szendroi (2004) and (11) from Féry & Hartmann (2005), in which main accents are not rightmost in their respective focus domains, even if the whole sentence is discourse new.⁴ In Féry & Samek-Lodovici (2006), constraints (5) are replaced by STRESSFOCUS and DESTRESSGIVEN in (8), which outline the relationship between discourse structure and accents in a direct way.

- (8) a. STRESSFOCUS (SF): A focused phrase has the highest prosodic prominence in its focus domain.
- b. DESTRESSGIVEN (DG): A given phrase is prosodically non-prominent.

These constraints interact with the prosodic constraints in order to determine the placement of accents. In the sentences under consideration, the location of main stress is conditioned by nested foci in which a focus, contrastive or not, is embedded into a larger one. In (9) for instance, the

pronoun, an anaphoric element or a deaccented constituent (see Prince 1981 and Gundel 1996 for relevant examples). Such a familiarity topic is given or inferable, or salient, and it tends to occupy the pre-field in German as the consequence of Formal Movement (see section 3.2).

This paper concentrates on contrastive topics. ‘Contrastive’ is used as a cover term for different pragmatic categories, sharing the fact that they elicit a set of alternatives, as shown by Büring (1997). Aboutness and frame-setting topics are forming a subclass of mildly contrastive topics which can be classified as discourse-setting. Aboutness, or shift topics specifies ‘what the sentence is about’ (Reinhardt 1981). This use of a topic can be understood as contrastive if the sentence could have been about something else. The example in (12), adapted from Jacobs (2001), illustrates this first meaning of topic. The speaker says about her mother that her health is fine, implying at the same time that there are other aspects which could be addressed as well, like her intellectual, marital, financial or psychic state.

- (12) *Gesundheitlich geht es meiner Mutter gut.*
‘As far as health is concerned, my mother is well-off.’

Frame-setting may be a variant of aboutness. It sets the sentence in a locational or temporal frame. Some examples are given in (13).

- (13) On Saturday, we usually go to the market and shop for the whole week.
In Cannes, older couples are spending several hours a day on the Croisette.

Implicational and partial topics are strongly contrastive. An implicational topic is intrinsically contrastive. Büring’s (1997) example is reproduced in (14). A realization of this sentence with a rising accent on the subject and a falling accent on the negation *keine* implies that somebody else’s wife might have kissed strangers. *Meine Frau* is contrasted with *X’s Frau*.

- (14) *MEINE/ Frau hat KEINE\ fremden Männer geküsst.*
‘My wife hasn’t kissed strangers.’

Partial topics are semantically and pragmatically elements of alternative sets (or posets in Prince’s terms). Büring (2003a) claims that an English contrastive topic is always realized by a fall-rise accent (B accent in Jackendoff 1972 and Steedman 2000) and that the term ‘contrastive topics’ that he uses to refer to these elements is in fact referring to Accent B. In the same paper, Büring takes up Roberts’ (1996) proposal that contrastive topics are reflecting a complex strategy of questions. In this perspective, the typical contrastive topic is a partial topic. This is best illustrated with Jackendoff’s (1972) famous example in (15) and (16).

- (15) a. Who ate what?
b. What about the beans? Who ate them?
c. What about Fred? What did he eat?
d. Fred ate the beans.

The strategy of questions used in dialogues using elements like those of (15) is illustrated in (16).

- (16) a. Who ate what?

- b. What did Fred eat? b'. FRED_{CT} ate the BEANS_F.
 c. What did Mary eat? c'. MARY_{CT} ate the EGGPLANT_F.
 etc.

The same question (16a) can be submitted to a strategy in which the next move after (16a) is to ask who ate some specific vegetable, as illustrated in (15c). The difference between the strategy illustrated in (16) and the latter one is that now the vegetables are contrastive topics, and no longer the persons who ate them.

Partial topics thus are ideal representants of topichood, but the other types of topics can be interpreted along the same lines, i.e. as being elements of a set of alternatives of the same class, or smaller. Even if aboutness and frame-setting topics, implicational and partial topics have different environments and different pragmatic implications, their common property is that they choose out of a set of inferable alternatives which element the sentence is about. It is this 'contrastive' property which is meant in the examples below.

3.2 *Topicalization*

German is a V2-language, which means that a pre-verbal position in a main clause is obligatorily occupied (see Thiersch 1978, and many others after him). This position is traditionally called the prefield (*Vorfeld*), and can be filled by a variety of constituents. According to Frey (2004), there are three different types of prefields in German. First, constituents which have been left-dislocated by true A-bar-movement, an operation which moves any constituent from the middle field (*Mittelfeld*), preserving whatever pragmatic property the constituent has acquired in this position. This operation always results in a contrastive interpretation. Second, a topicalized constituent can be first moved to the left of the subject, into a position occupied by topicalized constituents in the middle field, and only in a second step, this constituent is moved to the sentence-initial position (see also Müller & Sternefeld 1993, Grewendorf & Sabel 1994 and Haider & Rosengren 1998 for the view that arguments can be placed into a pre-subject position by scrambling). This topicalization is triggered by information structure and affects (maximal projections of) any category. It occurs both in root and in embedded clauses, and there must not be a resumptive pronoun related to it in the main clause. It is prosodically separated from the main clause by a prosodic boundary.

Elements arrive at their prefield surface position by means of a process called 'Formal Movement' in Frey (2004) which moves whatever is the highest element in the local middle field to the prefield in a pragmatically vacuous manner. Elements moved by formal movement only do not get a contrastive interpretation. In the unmarked situation, it is the subject of the sentence, but it can also be dative arguments of unaccusative and passive constructions, whichever element is the structurally highest phrase in IP (see also Lenerz 1977 and Müller 2003 for examples). For these elements, it is also the case that the highest position is their basis position. Prosodically, no particular emphasis is expected in this case. The difference between this operation and the preceding ones is that there is no movement due to pragmatic reasons in the middle field prior to the Formal Movement. A-bar topicalization may be related to filling the SpecCP, whereas the Formal Movement involves filling the SpecFinP (in Frey's account) or SpecIP. The difference is illustrated in (17) and (18).

Frey also recognizes a third possibility for filling the prefield, corresponding to a base generation of some constituents which are not licensed clause-internally. Adverbials which relate

to the discourse may be of this type, an example of which is given in (19). Some temporal adverbials also appear clause-initially without having any special pragmatic meaning.

(17) A-bar topicalization

- a. [CP *das Paket*₂ *hat*₁ [IP *Karl* t₁ [VP t₂ *weggebracht* t₁]]
the package has Karl taken.away
‘Karl has taken the package away.’
- b. *Mit dem Hammer hat Otto das Fenster eingeschlagen*
with the hammer has Otto the window smashed
‘Otto smashed the window with the hammer.’

(18) Formal Movement

- a. [IP *Karl hat*₁ [VP *das Paket weggebracht* t₁]]
Karl has the package taken.away
- b. *Einem Mitbewohner wurde die Geldbörse entwendet*
a-DAT flatmate was the purse stolen
‘A purse was stolen from a flatmate.’

(19) Base generation

- Ein Glück habe ich den Regenschirm dabei*
a luck have I the umbrella with.me
‘Fortunately, I have an umbrella with me.’

Frey claims that his proposal explains why constituents situated in the local prefield may be non-contrastive, whereas topicalized constituents moved over long distances are necessarily contrastive, and also why narrowly focused elements positioned in the prefield require other contexts than those which remain in situ.

Fanselow (2004) also distinguishes between the three forms of topicalization, but he proposes a unified analysis for A-bar movement and Formal Movement, the latter process he calls *Stylistic Fronting*. Both movements are explained in terms of feature checking. In A-bar movement an operator feature [+g] attracts a constituent which possesses [+g] as well. This feature may be an information structural feature like [+top] or [+foc]. In this case, a structurally higher category may be skipped for movement if it does not carry the matching feature, in violation of the Minimal Link Condition. In Stylistic Fronting, the attracting feature is an ordinary EPP-feature and the element closest to SpecCP is attracted.

Whatever the best syntactic analysis of topicalization turns out to be, the difference between A-bar-movement and pragmatically vacuous formal movement, or between EPP and information structural features is a useful distinction, which is reflected in the phonetic implementation. It is proposed here that the distinction should be implemented in the prosodic representation. Compared to its unmarked position in a clause, A-bar topicalization has the main effect of separating the topicalized constituent into a separate I-phrase. Compare (20).⁵

- (20) a. [[*Mein Bruder*]_P [*hat seiner Tochter*]_P [*neue SCHUHE gekauft*]_P]_I
My brother has his-DAT daughter new shoes bought
‘My brother has bought new shoes for his daughter.’
- b. [[[*Seiner TOCHTER*]_P]_I [[*hat mein Bruder*]_P [*neue SCHUHE gekauft*]_P]_I

His daughter has my brother new shoes bought

In (20a), the sentence is in its unmarked word order, with the subject in the prefield. Subject and internal arguments each form a separate P-phrase, and the whole sentence is included into one I-phrase (I). This sentence is intended to be wide-focused. Stylistic Fronting has applied and as a result, the subject has been moved to the prefield in a pragmatically vacuous manner because it was the highest element in the local middle field. The prosodic constraints can not help but select the candidate with the highest prominence on *Schuhe* as the optimal candidate, which is candidate (a) in Table 3. For reasons of space, the tableau only displays the verb's objects (internal arguments), and ignores the subject (external argument, see Table 1 instead). If both direct and indirect objects are in the same I-phrase, the phrase formed on the pre-participial argument plus the verb bears the sentential stress. The addition of prominence on the indirect object in Table 3 leads to an unavoidable violation of HI, as illustrated by candidate (c). Candidate (b) is suboptimal because it entails a violation of HI, which is absent in candidate (a). Candidate (d), with two I-phrases, loses the competition with (a) just because it contains two violations of *I-PHRASE.

Table 3: [seiner Tochter neue Schuhe gekauft]_F

	STRXP	*P-PHR	HI	HP	*I-PHR
a. \mathcal{F} (x) I (x)(x) P seiner Tochter neue Schuhe gekauft		**		*	*
b. (x) I (x)(x) P seiner Tochter neue Schuhe gekauft		**	*!	*	*
c. (x x) I (x)(x) P seiner Tochter neue Schuhe gekauft		**	*!	*	*
d. (x)(x) I (x)(x) P seiner Tochter neue Schuhe gekauft		**		*	**!

In (20b), the indirect object has been topicalized. In the intended interpretation, this object is a contrastive topic and the remainder of the sentence contains a focus, or is whole-focussed. For this reason, two main stresses are needed, one of them triggered by STRESSFOCUS (SF), which was formulated in (18a) and the other one by STRESSTOPIC (ST), formulated in (21). In the same way that SF requires a focus to be the most prominent element of its focus domain, ST requires a topic to be the most prominent element of its topic domain (for a definition of focus domain see Féry & Samek-Lodovici 2006 who lean on a proposal by Truckenbrodt 1995).

(21) STRESS-TOPIC (ST): A topic phrase has the highest prosodic prominence in its topic domain.

Since in (20b) two internal arguments require a prominent head, two IPs are formed, which can have equal prominence, as illustrated by candidate (a) in Table 4. The dative object is a contrastive topic, and ST requires it to be the most prominent element of its domain. In order to satisfy ST, the topic is separated from the rest of the clause by a stronger phrase boundary, an intonation phrase boundary. Thus, topicalization goes together with the creation of a new prosodic domain, and allows the topicalized constituent to be as prominent as the pre-verbal

direct object. Candidate (a) is better than candidate (b) because it fulfills both ST and HI: both IPs have an equally strong head. Candidate (b) fulfills HI as well, but violates ST by virtue of integrating the topical accent in the same IP as the focal one. Candidate (c) shows why an IP must be created on the topicalized constituent: it is not possible to attribute equal prominence to two P-phrases in a single IP without violating HP. The ranking $HI \gg *I\text{-Phrase}$ is motivated in this tableau. And finally, candidate (d) illustrates why topicalization implies fronting to the prefield. If the indirect object remains in the middle field (and the subject is fronted by Formal Movement as in (20a)), three I-phrases are created, one more than in candidate a. This, however is penalized by $*I\text{-Phrase}$.

In the syntactic approach sketched out above, the subject in candidate (a) remains in its canonical position, which is the first position of the middle field. As a consequence, it does not have to bear any special pragmatic interpretation, either when it is in the prefield or when it has been fronted by formal movement, an assumption which seems to be borne out, and which comes as a natural result in the OT analysis proposed here.

Table 4: [seiner Tochter]_T [hat mein Bruder neue Schuhe gekauft]_F

	ST	STRXP	*P-PHR	HI	HP	*I-PHR
a. $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{I}$ $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{P}$ Seiner Tochter hat mein Bruder neue Schuhe gekauft			***		*	**
b. $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{I}$ $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{P}$ seiner Tochter hat mein Bruder neue Schuhe gekauft	*!		***		*	*
c. $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{I}$ $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{P}$ seiner Tochter hat mein Bruder neue Schuhe gekauft			***	*!	*	*
d. $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{I}$ $\left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \left(\begin{array}{c} \text{x} \\ \text{x} \end{array} \right) \text{P}$ Mein Bruder hat seiner Tochter neue Schuhe gekauft			***		*	***!

The same prosodic structure, with two IPs, can be realized with the unmarked syntactic structure, as shown in (22), but it is in several respects less well-formed. First, the initial prosodic domain does not correspond to a syntactic phrase, and second, the two most prominent accents of the sentence are adjacent and violate as a result the constraint NOCLASH, formulated in (23), a violable constraint (Hayes 1995, Elenbaas & Kager 1999).

- (22) [Mein Bruder hat seiner TOCHTER]_{IP} [neue SCHUHE gekauft]_{IP}
 My brother has his-DAT daughter new shoes bought

- (23) NOCLASH: Equally strong accents are not adjacent.

The result of this section can be summed up as follows: topicalization of a maximal projection is triggered by the need to allow two constituents to be equally prominent. If two adjacent verbal arguments both require main accents, it is better to move one of them to the initial position of the sentence. Prosodically, it then forms a separate Intonation Phrase which can get as much prominence as the preverbal argument. Leaving both arguments in their canonical position leads to violation of the prosodic constraints. In the next section, it is shown that the same motivation, namely avoidance of stress clash and better prosodic shape, is also at play in discontinuous or split constructions, in which non-maximal projections are involved.

4 Split constructions

In discontinuous (or split) constructions, a nominal phrase is divided into two segments, separated by independent material. In (24a), the NP *rote Rosen* is in the middle field in its canonical order, with the adjective preceding the noun. In (24b), the noun *Rosen* is in the prefield, and thus precedes the adjective. The adjective *rote* is in the middle field, as in the canonical order, but now it is adjacent to the verb. Again an additional incidental change concerns the location of the subject, which is before the finite verb in (24a) and after it in (24b). As explained in the preceding section in relation with the discussion of (20b), both locations are unmarked.

- (24) a. *Maria hat rote Rosen gekauft.*
Mary has red roses bought
b. *Rosen hat Maria rote gekauft.*
roses has Mary red bought

This construction has been intensively studied from a syntactic perspective and has been alternatively analyzed in terms of movement or in terms of base-generation (see De Kuthy 2002 for a summary of the arguments for and against these options, and also van Hoof 2004 for an overview of the constructions in several languages). In the movement or remnant movement approach, the noun is moved to the front of the sentence, and the adjective remains in situ (see for instance van Riemsdijk 1989 and Müller 1998). In the base-generation or reanalysis model (see Fanselow 1987), the noun is generated in the prefield. An alternative explanation is the copy-and-deletion approach (Fanselow & Cavar 2002) in which the whole NP generated in the middle field is copied in the prefield, and the unrealized material is deleted in both positions. It is important to observe that there are a number of discrepancies between the continuous and the discontinuous versions of the NP, the most obvious ones being number incompatibility, and regeneration of a preposition (see van Riemsdijk 1989 for German), facts which disfavor a movement approach. From a typological perspective, this kind of ‘inverted’ split construction is only possible in languages which permit noun-dependents to be nominals by themselves, a second factor strongly speaking for base-generation as the most plausible analysis.

Fanselow & Cavar (2002), as well as De Kuthy (2002) and Féry & Paslawska (2005) for Ukrainian, consider not only the syntactic facts but also the discourse structural motivation for split constructions. They find a motivation for the NPs’ discontinuity in their information structural properties. In most cases, the preposed element is a topic and the element in situ is a focus. Thus, (24b) could be typically uttered in a situation in which *roses* have been previously introduced into the discourse. In the sentence under consideration, they are mentioned again and contrasted with other flowers. The speaker adds the new or otherwise prominent information that the roses Mary bought are red (rather than of another color).

From the perspective of the prosody, the set of constraints introduced until now lead to a structure in which the word *Rosen* in (24a) invariably bears main prominence. This is illustrated in Table 5.

Table 5: [Maria hat rote Rosen gekauft]_F

	STRESSXP	*P-PHRASE	HI	HP
a. \mathcal{F} (x) I (x x) P Maria hat rote Rosen gekauft		*		*
b. (x) I (x x) P Maria hat rote Rosen gekauft		*	*!	*
c. (x x) I (x x) P Maria hat rote Rosen gekauft		*	*!	*

Table 5 contains a simplification since the NP *rote Rosen* contains two lexical heads, an adjective and a noun, and STRESSXP requires both of them to project a phrasal accent. The whole NP is finally accented, and is analyzed as a recursive P-phrase, as shown in (25). The adjective and the noun are integrated into a single P-phrase on rhythmical grounds (Nespor & Vogel 1986, Selkirk 1984, Ghini 1993). In the following, the lower P-phrase structure is no longer considered.

$$\begin{array}{c}
 (\quad x \quad) P \\
 (x \quad)(x \quad) P \\
 (25) \quad \text{rote Rosen}
 \end{array}$$

The discontinuity of an adjective (or quantifier, numeral and the like) and its head noun finds a double motivation. First, as illustrated in the preceding section with maximal projections, the need to provide both elements with equal prominence triggers the formation of two phrases, topicalization being the most obvious solution. Indeed, it allows a structure which fulfills NOCLASH by keeping the two prosodic heads as far apart as possible. In split constructions, the prosodic phrases are not adjacent, as has been demonstrated for contrastive topicalization in the preceding section. Second, the sentence initial position is preferably associated with a rising bitonal tone for topic, and the preverbal one with a falling accent for focus (see Büring 1997). When adjective and noun are adjacent, assigning two accents inevitably leads to a rising accent on the adjective and a falling one on the noun, the reverse of what is found in a split construction. In Table 6, *I-PHRASE is left out for reason of space. A candidate with only one I-phrase, like (b) and (c) is eliminated through the effect of higher-ranking constraints.

Table 6: [Rosen]_T hat sie [rote]_F gekauft

	SF	ST	STRESSXP	*P-PHRASE	HI	HP
a. \mathcal{F} (x)(x) I (x)(x) P Rosen hat sie rote gekauft				**		*
b. (x) I (x)(x) P Rosen hat sie rote gekauft	*!			**	*	*
c. (x) I (x)(x) P Rosen hat sie rote gekauft		*!		**		*

Note that an interpretation of the preposed element as a topic is facultative. It can also be a focus, the only restriction being that the two parts of a split construction cannot be elements of one and

the same focus. The fronted part can also be the only focus of the sentence, in which case the remaining of the sentence is backgrounded, and deaccented. If both elements of a split construction bear structural information, an asymmetrical information structure seems to be obligatory in split constructions. A dialogue like (26) is not well-formed, if B's answer is intended to be exhaustive. In a well-formed answer to (26A), adjective and noun, which form together a narrow focus, are adjacent, as shown in the three well-formed options in (26C). Only the noun carries main stress.

- (26) A: Was hat sie gekauft? ‘What has she bought?’
 B: #ROSEN hat sie ROTE gekauft.
 C: Sie hat rote ROSEN gekauft./ Rote ROSEN hat sie gekauft./ Rote ROSEN.

Similarly, elements of split constructions cannot be parts of a single topic. This is illustrated in (27). In (27B) *Rote Rosen* and *weiße Nelken* are topics by virtue of being subsets of a given superset, and the verbs are the foci of the answer. Splitting the noun and the adjective induces a focus on the noun or on the adjective, which is not intended by the context (27A). A well-formed answer is provided in (27C): the flowers and their color are topicalized and the participles are the foci of their clauses.

- (27) A: *Was hat sie mit roten Rosen und weißen Nelken getan?*
 ‘What has she done with red roses and white carnations?’
 B. #ROSEN hat sie ROTE GESCHNITTEN und NELKEN hat sie WEIßE GEPFLÜCKT.
 roses has she red cut and carnations has she white picked.
 C. ROTE ROSEN hat sie GESCHNITTEN und WEIßE NELKEN GEPFLÜCKT.
 red roses has she cut and white carnations picked.

Next, consider (28). In this example, both parts of the split construction (28B) are in focus, but crucially they are foci of two different wh-questions.

- (28) A: *Wieviele von welchen Blumen hat sie gekauft?*
 How many of which flowers has she bought?
 B: ROSEN hat sie ZWÖLF und NELKEN (hat sie) ZWANZIG gekauft.
 roses has she twelve and carnations has she twenty bought.
 C: *Sie hat ZWÖLF ROSEN und ZWANZIG NELKEN gekauft.*
 ‘She has bought twelve roses and twenty carnations.’
 D: *ZWÖLF hat sie ROSEN und ZWANZIG hat sie NELKEN gekauft.
 ‘She has bought twelve roses and twenty carnations.’

A different and equally plausible analysis in (28B) involves a topic on the noun and a focus on the numeral. In this reading, *Rosen* and *Nelken* are members of a closed, contextually given set, and number of bought flowers is being questioned. In multiple questions there seems to be a strong tendency for one of the wh-words to be D-linked and act as a sorting key for the answer.⁶

In fact, both answers (28B and C) seem to be equally well-formed: violation of stress clash is as good an option as a split construction, (see 28C and also 28B when the auxiliary *hat* and the pronoun *sie* are elided). In (28B), the nouns have preferably a rising accent and the adjectives a falling one, and the preferred analysis is one involving a topic and a focus. In (28C), both the

numerals and the flowers are preferably analyzed as foci. There is no need to reverse the order of the adjective and the noun and the unmarked word order with the adjective preceding the noun is chosen, since there is no preference for a certain type of pitch accent on one of the two stressed words. (28D) is syntactically not well-formed, but, from the point of view of the information structure, it should be as good as (28B). As an answer to a question like *Welche Blumen hat sie gekauft und wieviele?* ‘Which flowers did she buy, and how many?’, (28B and C) are equally well-formed, whereas (28D) is again rather marked.

The next example, in (29), illustrates a sentence which contains different elements of the constructions that we have examined so far.

- (29) *Das gute Essen hat Maria immer gemocht, aber FISCH konnte sie noch NIE leiden*
 The good food has Maria always liked but fish could she yet never bear
 ‘Maria has always liked good food, but she always hated fish’

The proposal assumed in this paper enhances the prosodic side of such constructions, which is a direct consequence of avoiding stress clash and the need to realize two accents with equal prominence. Both *nie* and *Fisch* are accented by virtue of bearing individual pragmatic features, even in a context in which the whole sentence is focused. The structure of the preceding clause is such that two different points of information are required, the first being of the kind of food under debate and the second being Maria’s taste. In addition to being part of the focus, *Fisch* can be interpreted as a topic and topics are better realized with rising accents. It is a topic by virtue of being inferable from good food (see Reinhart 1981 among others for the topic status of inferable items). The adverb *nie* has narrow focus, in addition to being part of the focus of the whole sentence. It is thus better with a falling accent. The information structure of a sentence like (29) is shown in (30).⁷

- (30) [[*FISCH*]_T [*konnte sie noch* [*NIE*]_F *leiden*]_F]_F
 fish could she yet never bear

Table 7 shows how the constraints elicit candidate (a) as the optimal candidate. The optimal candidate (a) separates the topic and the focus in two different I-phrases. *Nie* is an embedded focus, and as such carries the prominence of the whole focused sentence instead of the verb *leiden*, which is, everything being equal, the rightmost stressable word (see Féry & Samek-Lodovici 2006 and section 2). All the other candidates violate either SF or ST, and are thus eliminated from the outset. Candidate (b) is like candidate (a) except for the fact that it has an additional P-phrase on the final verb. It fulfills Stress XP and HP better than candidate (a) but *nie* is not the most prominent constituent in its domain, and thus it violates SF. Observe that preserving the prosodic structure of candidate (b), but moving the main accent to *nie* does not solve the problem, because at the level of the P-phrase, *nie* is not more prominent than *leiden*, and SF requires it to be at the level of the P-phrase as well. Candidate (c) does not attribute enough prominence to the topic, and candidate (d) violates SF because *nie* is not the most prominent item in its domain. In view of the focus of the whole sentence, the accent on *Fisch* is enough, but the prominence on *nie* is lacking.

Table 7: [[Fisch]_Tkonnte sie noch [nie]_F leiden]_F

	SF	ST	STRESSXP	HI	HP	*P-PHRASE
a. \mathcal{F} (x)(x)I (x)(x)P Fisch konnte sie noch nie leiden			*		*	**
b. (x)(x)I (x)(x)(x)P Fisch konnte sie noch nie leiden	*!					**
c. (x)(x)I (x)(x)P Fisch konnte sie noch nie leiden		*!	*		*	**
d. (x)I (x)P Fisch konnte sie noch nie leiden	*!		*	*	*	**

To sum up this section, contrast, aboutness and topicality are properties associated with rising tones, and are usually found sentence initially. Splitting of constituents is induced by the need to realize two different discourse structure properties on the two elements, multiple foci and topic plus focus being the most obvious options.

6 Conclusion

Two constructions have been examined in the paper. First, contrastive topicalization, and second, split constructions. It has been shown that in both cases, prosody plays an important role for the motivation of these constructions, since it has the effect of changing the linear ordering of the constituents. Topicalization often fulfills the need to create a new prosodic domain. This new phrase, analyzed in the present paper as an I-phrase (intonation phrase), presents an alternative to a structure which would otherwise contain two adjacent accents. Moreover, it creates a configuration in which the constituent carrying the topic feature of the sentence may be initial, and thus able to have a rising pitch accent. Similarly, if the focus is final in its I-phrase, it may carry the nuclear falling accent. OT is an excellent framework to deal with this kind of phenomena because it does not pre-empt an organization of grammar in which syntax precedes phonology. On the contrary, it is possible to order syntactic and prosodic constraints so that prosody may influence syntax. In the analysis which has been proposed in this paper, syntactic constraints interact with prosodic ones, and deliver a picture of grammar where placement and shape of pitch accents play a major role for word order.

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- ² As far as I-phrases are concerned, no unique syntactic construction can be found with which they coincide. For this reason, no constraint similar to STRESSXP is offered here. An I-phrase, like a P-phrase, is uniquely headed.
- ³ Another way to explain the accent on *him* in (7a) is in terms of nested foci, as in Féry & Samek-Lodovici (2006). The wh-constituent *who* triggers an extra-F-mark inside of the VP, and this extra-F-mark renders *him* more prominent than the verb, see below for the relevant constraint.
- ⁴ See also the so-called Second Occurrence Focus (SOF) sentences, as discussed in Beaver et al. (2004) and in Féry & Ishihara (2005), which present a slightly different challenge for the theory presented here. SOF is realized with a pitch accent prenuclearly, but is subject to deaccenting postnuclearly.
- ⁵ Frey (2004) also claims that the word order of (20b) can be found in a sentence in which *seine Tochter* is not contrastive. In this case, scrambling has applied first, and in a second step formal movement. This case is not considered here, but I assume that the prosodic structure of such a sentence is similar to the one of (20a).
- ⁶ Thanks to Shin Ishihara and to the anonymous reviewer for pointing this out.
- ⁷ The anonymous reviewer points out that in a topic prominent language like Romanian, *fish* in the same context would be topicalized and the negative quantifier could move to the sentence-initial structural focus position immediately following the topic.

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