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Introduction

Focus and the interaction between syntax and pragmatics☆

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1. Focus and the nature of the interface

A well-formed sentence satisfies all the syntactic, semantic, morphological and phonological principles of the grammar. If it does, the utterance is an expression of the given language. This does not imply, however, that the utterance of such a sentence can be used appropriately in any discourse context. Discourse is organized by information packaging devices, such as topic, focus etc. If the information structure of a particular expression does not match the information packaging required by the context, the expression is infelicitous in that context, albeit grammatically well-formed. For instance, the utterance in (1b) is not felicitous in the context of (1a), even though it is a well-formed expression of English.[1]

(1) a. What did John eat?
b. #JOHN ate the pizza.

It is a well-known characteristic of *wh*-questions that they require an answer whose focus is the constituent corresponding to the *wh*-phrase. In (1b), the focus of the utterance is on the subject, *John*, indicated by underlining. In contrast, the *wh*-question in (1a) requires an answer whose focus is the direct object. As a result of this incompatibility of information structure, (1b) is not appropriate in the context of (1a). The incompatibility of the question–answer pair in (1) indicates that certain

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[1] Infelicity is marked by #. Small caps indicate main prosodic prominence; underlining marks focus.

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aspects of information structure are grammatically encoded. The utterance in (1b) has some grammatical properties that disallow it in the context of the *wh*-question in (1a), requiring focus on the object.

The papers in this volume investigate the grammatical properties that are relevant for the representation of certain discourse notions, such as focus. In other words, the purpose of this volume is to identify which levels of representation and which notions of linguistic theory are necessary to determine the discourse status of an expression at the interface. This introduction describes in detail two opposing GB/minimalist views on the nature of the interface with respect to focus: the feature-driven approach to focus and the stress-based approach. The two views are compared from a conceptual standpoint and the papers in the volume are summarised in the light of the previous discussion.

On the one hand, as we shall see, the feature-driven approach to focus advocates a deterministic view in the strongest sense. In other words, in this view the focus of an utterance is directly and unambiguously represented in the syntactic representation. On the other hand, the stress-based approach argues for the representation of focus in the prosody rather than in the syntax. It also claims that the prosodic representation determines the set of potential foci rather than the actual focus of an utterance.

In this work I take focus to be the part of an utterance that is new or asserted. The rest of the utterance is the background (or in some cases the presupposed part). In particular, a diagnostic test to identify the focal part of an utterance is the *wh*-test. As I mentioned above, the part of the utterance that provides the answer to a *wh*-question is the focus. So, the focus of the answer in (2), indicated by underlining, is the DP_{DO}.

(2) Q: What did John eat?
A: John ate the PIZZA.

I use focus in the widest possible sense. Semantico-pragmatic distinctions such as contrastive focus, identificational focus (É. Kiss, 1998) etc. are all understood to be part of the notion focus.

Presupposing somewhat the discussion of some conceptual issues, let us briefly review the literature on focus in light of some questions related to the nature of the interface between the grammar and discourse. I will concentrate on two of these: does the grammar (in its wide sense; i.e. including phonology but not pragmatics) determine the focus of an utterance? If so, does the grammar encode focus unambiguously?

In the syntactic literature, there is a wide range of views on the issue of the grammatical representation of focus.[2] The spectrum ranges from the functional

[2] Works that deal with focus and other discourse roles from a semantic perspective include Szabolcsi (1981), Krifka (1991), Diesing (1992), Rooth (1992) and Büring (1995). The prosodic aspect of focus is investigated by Cinque (1993), Gussenhoven (1984), Hayes and Lahiri (1991), Pierrehumbert and Hirschberg (1990), Rochemont (1986). Bosch and Van der Sandt (1999) investigate the issue from a performance perspective.

sentence perspective (i.e. the Prague School) through the discourse theoretically motivated works (e.g. Gundel, 1974; Prince, 1979, 1981; Reinhart, 1981; Lambrecht, 1994; Vallduví and Engdahl, 1996; Erteschik-Shir, 1997) to the strict 'encoding'-view of the GB-Minimalist literature.

The Prague School view, at least in its original form (e.g. Dezsö, 1974; Hajičová and Sgall, 1988; Hajičová et al., Sgall 1998 and others), did not perceive the representation of focus in the grammar as an issue, as for them, discourse notions such as focus and topic were readily available in the grammar itself. Their functionalist and to a large extent descriptivist point of view enabled them to make certain far-reaching generalisations (e.g. the fact that the topic usually precedes the focus; or the tendency for topics to be left-peripheral), and they intended to go no further.

The pragmatic approaches to focus, in particular the different works based on Relevance Theory (Sperber and Wilson 1986/1995; see also Kempson et al., 2001; Breheny, 1998), advocate a certain under-determinacy of the grammar with respect to focus. They argue that the focus of an utterance is not fully determined by the syntactic and prosodic make-up of the utterance, although no doubt these contribute to the actual focus. In particular, Sperber and Wilson (1986/1995) and Breheny (1998) emphasize the important role stress assignment plays in determining the focus of the utterance. Furthermore, pragmatic principles, knowledge of previous discourse and other kinds of world knowledge may be required to determine the focus of an utterance at the interface.

The GB/minimalist approaches are the strictest in the sense that they advocate a direct and unambiguous mapping between the grammatical representation of an utterance and its focus.[3] From now on, I will concentrate on these approaches. In the generative literature the standard view of the late eighties and early nineties was and to a large extent still is that focus is directly and unambiguously represented in the syntactic representation. (cf. Jackendoff, 1972; Antinucci and Cinque, 1977; Calabrese, 1982, 1993; Abraham et al., 1986; Horváth, 1985; Rochemont, 1986; Rochemont and Culicover, 1989; É. Kiss, 1995, 1998; Rizzi, 1997; Vallduví and Vilkuna, 1998; Zubizarreta, 1998)

Partly as a result of considerations put forward in more recent forms of minimalism, research into interface questions was given a new perspective. Given the autonomy of syntax and its conception as a 'dumb computational system' (Chomsky, 1995) it would not be expected that focus, topic and other pragmatic notions would be directly encoded in the syntactic computational system. In effect, as we shall see below, featural encoding of such notions violate Chomsky's (1995: 228) inclusiveness condition. To capture the nature of the disagreement, the question might be expressed in the following form: Are focus, topic and other pragmatic notions directly and unambiguously represented in the syntax? If the answer turns out to be positive, then we have a largely enriched computational system and a

[3] In what follows I shall describe in more detail two GB/minimalist approaches to focus: the standard feature-based view and the stress-based approach. There are other works that advocate a deterministic encoding of focus in the grammar, but which fall outside the GB/minimalist framework and are not considered here. These include King (1993, 1997); Butt and King (1996), Kempson et al. (2001), and Steedman (2000) among many others.

virtually trivial interface, as the mapping between the syntactic encoding of the pragmatic notions and the actual notions themselves is one-to-one and involves no intermediary steps. If, on the other hand, the answer turns out to be negative, then we set the scene for a real interface issue. The question then becomes the following. How are focus and other pragmatic notions identified at the interface(s)? Do they derive from syntactic structure in an ambiguous or indirect fashion? Or is syntactic structure underdetermined with respect to pragmatic notions? Do they derive from prosodic, lexical, morphological considerations in addition to or instead of syntactic ones?

In what follows, I shall describe two GB/minimalist approaches that give opposing answers to these questions. First, I examine the standard GB/minimalist approach to focus, which I term the feature-driven approach. This view assumes that there is a syntactic [+Focus]-feature in the grammar and a corresponding functional Focus head projected in the left-periphery of the sentence. A thorough investigation of the characteristics of this approach is the subject of the next three sections (Sections 2–4). It will be shown that this theory gives a strict answer to the encoding question: the mapping between syntax and discourse is unambiguous, one-to-one. The interface is, therefore, trivial or near trivial.

Then, an alternative, the stress-based approach (Reinhart, 1995), will be considered (Section 5). In this approach the potential foci of an utterance are determined by the position of main stress in the utterance. This approach argues against a one-to-one mapping, nevertheless it maintains that the grammatical representation (albeit not the syntactic representation, rather the prosodic representation) determines the set of potential foci.[4]

The comparison of the two approaches uncovers serious theoretical issues such as the status of Chomsky's (1995) inclusiveness condition and the existence of direct communication between PF and LF. I will conclude that neither of the approaches can be favoured over the other one on conceptual grounds.

Rather, the arguments for a trivial or a rich interface have to be formulated on empirical grounds. This is where the papers in this volume are highly relevant, as the authors give genuine syntactic arguments and present us with specific puzzles from a range of languages—Chinese, Danish, East Cree, Russian and Turkish are just examples—bearing on the nature of the interface.

In support for a syntactic encoding view of pragmatic notions, **Speas** argues that certain pragmatic notions have a hierarchical nature and show locality effects that are easily explained if they are directly represented in syntax. **Xu** claims that although a prosodic view of focus finds support in Chinese, he shows that it cannot go all the way, and a syntactic representation of focus is sometimes necessary.

Junker, **Pereltsvaig**, and **Erteschik-Shir and Strahov** show that focus or topic constituents are *aligned* with *edges* of syntactic domains rather than occupy certain specific positions. This behaviour is not characteristically syntactic, therefore, they

[4] Since the set of potential foci of an utterance is unambiguously represented in the grammar in the stress-based approach, this approach is within the bounds of GB/minimalist approaches in the sense mentioned above that these approaches advocate grammatical encoding of discourse notions.

argue, alternative treatments have to be offered. **Kennelly** argues that in the case of focus, a syntactic treatment of scope in terms of quantifier raising is mistaken. Rather, discourse/pragmatic information has to be available at the level where scope is determined.

A more detailed summary of each paper is given in Section 6.

2. The feature-driven approach

The feature-driven approach stems from three independent factors: (i) the fact that focus is quantificational (ii) the assumption that quantificational elements are assumed to take their respective scopes via quantifier raising (May, 1977) and (iii) the assumption that movement is driven by the need to check uninterpretable features (Chomsky, 1995: 310). Let us take these in turn.

The fact that focus is quantificational can be illustrated by the examples in (3) where (3a) is true while (3b) is false in the context in (3c) even though (3a) and (3b) differ only in focus.[5] In other words, two sentences may differ in truth-value if they only differ in focus.

(3) a. John only gave a book to SUE. TRUE
b. John only gave a BOOK to Sue. FALSE
c. John gave a book and a pen to Sue. He gave nothing else to anybody.

The treatment of focus in terms of 'quantifier raising' was already suggested by Chomsky (1976), who noted that backward coreference is ruled out if the full DP is focused, while allowed, if not.[6] Thus (4b), as opposed to (4a), is ungrammatical.

(4) a. The man that she met liked Mary.
b. *The man that she$_i$ met liked MARY$_i$.
LF: MARY$_i$ [the man that she$_i$ met liked t$_i$]

Chomsky (1976) argued that the ungrammaticality of (4b) can be explained if one assumes that the focal element undergoes fronting at LF. (4b) is a weak crossover violation resulting from the LF movement of the focused element over the coindexed pronoun. Thus (4b) is similar to (5), where the movement of the *wh*-element across a coindexed pronoun is ruled out as a weak crossover violation.

(5) *Who$_i$ does the man that she$_i$ met like t$_i$?

[5] Note that one cannot blame the presence of *only* for the effects on truth-value. Szabolcsi (1981) showed that focus can affect truth-values, even in the absence of focus sensitive operators.

[6] Kennelly, in her contribution, argues explicitly against a treatment of different scope readings of focus in terms of quantifier raising, thereby questioning the basic assumption of May (1977).

Note that this argument is considerably weakened by the observation, already made by Jackendoff (1972), that focus disregards syntactic islands. This is illustrated in (6) for a complex NP island. This would mean that focus movement (or maybe LF movement in general) is different from overt movement—an undesirable outcome.

(6) Sam only saw a [$_{NP}$ man [$_{CP}$ who was wearing a RED hat]

In addition, Williams (1997) points out that a weak crossover account would incorrectly predict that 'backward-and-down' anaphora cases like (7) are ungrammatical. This is because (7) would yield the LF indicated, which contains a weak crossover violation.

(7) Anyone who has written it$_i$ can turn HIS TERM PAPER$_i$ in to me.
LF: HIS TERM PAPER$_i$ [anyone who has written it$_i$ can turn t$_i$ in to me].
(Williams, 1997: Ex. 33a)

In generative approaches, which encode the notion of focus in the grammar unambiguously, it is generally assumed that the element that bears focus has a [+Focus]-feature, and that a functional head, Focus, projects in the left-periphery of the clause. The focused element moves to the specifier of the Focus head to check features in a spec-head configuration. An abstract schema is given in (8).

(8) [$_{FP}$ XP_{FOCUS} F ... [$_{VP}$ V t_{XP}]
[+F] [+F]

This was proposed for many languages with the only difference being the location of the FocusP with respect to other heads, its possible amalgamation with functional heads bearing other features (e.g. I or C), and whether the movement of the focused constituent (and of the V) is overt or covert (cf. Bródy, 1990, 1995 on Hungarian; Rizzi, 1997 in Italian; Tsimpli, 1995 on Greek; Laka, 1990, Ortiz de Urbina, 1999 on Basque; Ouhalla, 1994 on Standard Arabic; Tuller, 1992 on Chadic languages; Vilkuna, 1994 on Finnish and many works in É. Kiss, 1995 and Rebuschi and Tuller, 1999).

Hungarian is well known to exhibit a specific syntactic construction for focusing. So I will use this language to illustrate the issue. The focused element appears at the left-periphery of the clause, immediately followed by the finite verb. The standard analysis of the Hungarian left-peripheral focus construction assumes that a [+Focus]-feature (henceforth [+F]) is present on every contrastively focused constituent (cf. Horváth, 1985; Bródy, 1990, 1995; Kenesei, 1998). [+F] is freely assigned to a constituent and at LF, the [+F]-marked constituent is interpreted as focused.[7] The idea of a syntactic focus feature is due to Jackendoff (1972):

[7] Hence the name: a feature-driven approach to focus.

'I suggest the following way, which does minimal violence to the theory as a whole. One artificial construct is required: a syntactic marker F which can be associated with any node in the surface structure.' Jackendoff (1972: 240)

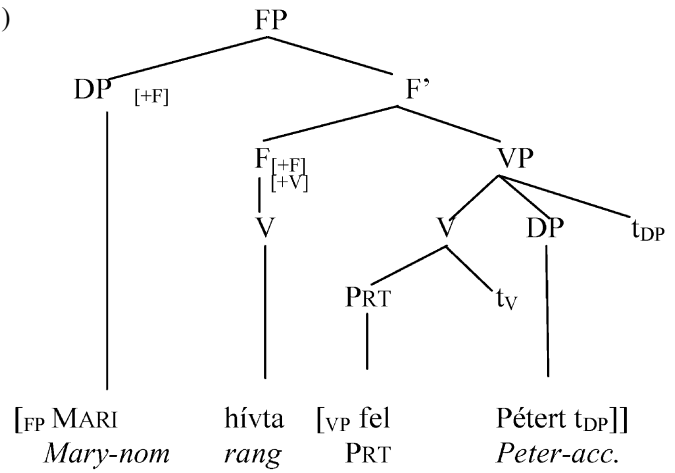
He further claimed that the F-marked constituent is taken to be the semantic focus of the utterance, by his focus assignment principle (Jackendoff, 1972: 240). Let us formulate focus marking and interpretation here as follows.

(9) *[+F] marking* (first version)
Assign [+F] to a constituent.

(10) *[+F] interpretation at LF* (first version)
Interpret the [+F]-marked constituent as focus.

Following Pollock's (1989) split IP hypothesis, there is also a corresponding functional head, Focus, projected in the functional domain. If the Focus head is strong, as it is in Hungarian, it will trigger overt movement of the constituent bearing [+F]. In a tensed sentence, this is accompanied by V movement to F, thus the focused constituent and the V are adjacent. The main data supporting V-movement are sentences that contain verbal particles. This is illustrated in (11).[8] In Hungarian the default position for particles is preverbal; it is immediately in front of the V. In sentences which have a focused element, the particle follows the verb. This is an indication of V-movement.

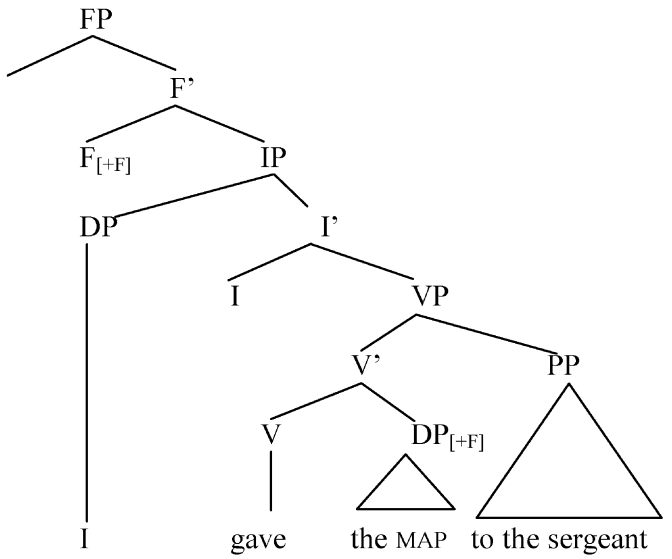
(11)



If the Focus head is weak, as it is in English, the focused constituent will remain in situ (at least in the overt syntax). This is illustrated in (12).

[8] The VP in (11) has a flat structure, in accordance with É. Kiss (1994). This choice does not affect the claims made in this work. The same holds for (25).

(12)



An immediate advantage of this view is that it highlights the parallelism between focus and *wh* in the sense that focus movement is triggered by [+F] just as *wh*-movement is triggered by [+wh]. It has long been noted that focus in languages like Hungarian behaves similarly to *wh*-elements.[9] In particular, as (13) shows, Hungarian focus movement is in complementary distribution with *wh*-movement in simple clauses, suggesting that the focus element and the *wh*-word occupy the same surface syntactic position (e.g. Horváth, 1986). As (13a) and (13b) illustrate, the adverb *ritkán* 'rarely' obligatorily moves to the preverbal focus position, accompanied by the movement of the finite verb. It is apparent from (13c) through (13f) that the fronting of the adverb is disallowed, if a *wh*-element is present in the clause.

(13) a. RITKÁN jár ide.
Rarely comes PRT
'He rarely comes here.'
b. *Ide jár RITKÁN.
c. Ki jár ide RITKÁN?
Who comes *prt* rarely
'Who comes here rarely?'
d. *Ki RITKÁN jár ide?
e. *RITKÁN ki jár ide?
f. *RITKÁN jár ki ide?

[9] Note, however, that as Lipták (2001) convincingly argues, even in languages like Hungarian, a closer inspection of the parallelism reveals many problems with a fully unified treatment of *wh* and focus.

Focus and *wh* appear to behave in a similar way not only syntactically, but also semantically. Following Jackendoff (1972), we may represent the non-focal part of an utterance by replacing the focus by an appropriate semantic variable, which is existentially bound, as in (14b). Arguably, the *wh*-question in (14c) carries the same presupposition. In a negative answer to a *wh*-question, such as (14d), the presupposition is denied.[10]

(14) a. It is the man in the red hat that John saw.
b. ∃x (John saw x)
c. Who did John see?
d. No-one. ¬∃x (John saw x)

Thus, the feature-driven approach easily accommodates many syntactic and semantic characteristics of focus. However, as it stands, it fails to capture prosodic facts. There is a strong generalisation known at least since Chomsky (1971), Jackendoff (1972) and Selkirk (1984, 1986) (in the functionalist literature Dezső, 1974 and Harlig and Bardovi-Harlig, 1988), that at least in English, the focus of the utterance is always marked by some kind of prosodic prominence: main stress or pitch accent. I will call this generalisation stress-focus correspondence (see 20 below). As it stands, the feature-driven approach does not account for the interaction between focus and stress simply because it does not say anything about prosody.

There is also a conceptual issue. As Zubizarreta (1998) observes, the notion of a [+Focus]-feature is conceptually problematic. In fact, Chomsky (1995: 228) states that

> 'a "perfect language" should meet the condition of inclusiveness: any structure formed by the computation [...] is constituted of elements already present in the lexical items selected for N [the numeration]; no new objects are added in the course of the computation apart from rearrangements of lexical properties [...]. Let us assume that this condition holds (virtually) of the computation from N to LF (N → λ)'.

At least in the present formulation of the feature-based approach, [+F] violates the inclusiveness condition in the following sense. [+F] is assigned to a constituent by (9). Take any lexical item dominated by that constituent. There is no sense in which it would be a lexical property of this item for a (potentially) larger constituent to bear [+F]. Thus, [+F] is nothing more then a diacritic introduced into the

[10] Note that to obtain the existential presupposition at LF the *wh*-element translates into a variable, while the focal element is replaced by one. Thus, semantic considerations establish a parallel between the non-focal part of an utterance and the *wh*-question. There is no such parallel established between the semantics of a focal element and the *wh*-element itself. So strictly speaking, there is no semantic argument for the parallel treatment of focus and *wh*, only for a parallel treatment of the non-focal part of an utterance with focus and the non-*wh*-part of a *wh*-question.

computation (by 9) to account for something that does not directly relate to any lexical property of any lexical item.

3. Inclusiveness

Let us examine the conceptual problem in more detail first. Recall the principle of [+F] marking repeated here for convenience.

(15) =(9) *[+F] marking* (first version)
Assign [+F] to a constituent.

This principle violates inclusiveness in a very precise sense. According to inclusiveness, in a minimalist grammar there are two ways a node may acquire some property, i.e. a feature. A terminal node may be assigned a feature from the lexicon. A non-terminal node has to inherit its features from its daughters, which created the non-terminal node via merger. This is formulated as follows (cf. also Chomsky, 1995: 228).

(16) Inclusiveness
a. The properties of a non-terminal node are fully recoverable from its daughters.
b. The properties of terminal nodes are recoverable from the mapping principles [between the lexical–conceptual system and the grammar].
(Modified from Neeleman and Van de Koot, 2002: 529)

In particular inclusiveness ensures that no information may enter the derivation via a non-terminal node, and thus that all the information present in the tree ultimately comes from a terminal node. It also regulates the spread of information in the tree. It has the effect that information on a terminal node is not available outside the subpart of the tree that dominates the terminal node in question.

Given the first part of the definition of inclusiveness (16a), it is not possible for a non-terminal node to possess a [+F] feature if neither of its daughters have that feature. So, the principle of [+F] marking in (15) has to be changed. The grammar cannot have a principle that assigns a feature to a constituent when neither of its daughters possess that feature. As a first step towards a solution, one may assign the [+F]-feature to terminal nodes, allow for its percolation to non-terminal nodes (cf. Selkirk, 1984) and reformulate the LF-interpretation principle accordingly. The reformulated principles of [+F] marking, percolation and interpretation are given below.

(17) *[+F] marking* (second and final version)
Assign [+F] to a lexical item.

(18) *[+F] percolation*
Allow the percolation of [+F] from a node to a dominating node.

(19) *[+F] interpretation at LF* (second and final version)
Interpret the largest [+F]-marked constituent as focus.

Note that this state of affairs violates inclusiveness in the sense that it still contravenes (16b), the second clause of the definition—thus only in a weaker sense. The fact that [+F] satisfies the first clause, (16a), means that it behaves like other syntactic features in the grammar. This is important as a syntactic encoding of a pragmatic notion would be rather unwelcome if it involved characteristics that are otherwise not normally present in syntax.

Nevertheless, [+F] is clearly not a lexical feature. The notion of focus itself is not a property of a constituent, but rather a relation. It encodes the information status of a constituent relative to the rest of the utterance. If a constituent is focused, then the rest of the utterance is backgrounded (or presupposed). For this reason, focus may never be a property of a single node, let alone a lexical property of that node. So in this sense, an approach that encodes focus in the syntactic computation, such as the feature-driven approach, will always violate inclusiveness.

4. Stress–focus correspondence

Let us now turn to the issue of the stress–focus correspondence. One way to account for it is to state it, as Reinhart (1995) does, in the form of a universal principle:

(20) *Stress–focus correspondence*:
The focus of an utterance always contains the main stress of the utterance.

But where does this principle apply? Reinhart (1995) assumes that it applies at the interface between the grammar and the conceptual system. But this raises a theoretical issue in the following sense. According to Chomsky (1995: 219–220), a language L consists of expressions that are ordered pairs (π, λ). An expression (π, λ) is convergent at PF if π satisfies Full Interpretation at PF, and it is convergent at LF if λ satisfies Full Interpretation at LF. The expression converges if it converges at both interfaces; otherwise, it crashes. He goes on to say that 'we thus adopt the (nonobvious) hypothesis that there are no PF–LF interactions relevant to convergence' (Chomsky, 1995: 220). Let us formulate this hypothesis as in (21).

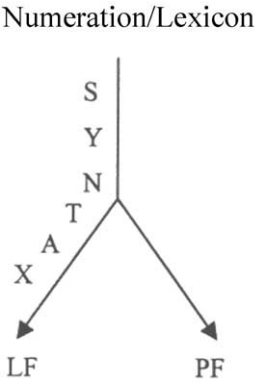
(21) *Hypothesis of no direct PF–LF communication*
The only communication between PF and LF is via syntax.

Given (21) the grammar has to observe (22).

(22) *Uniformity of interface conditions*
No interface condition (filter, rule, definition etc.) can be stated on either the PF or the LF interface that makes direct reference to information that is only available at the other interface.

Thus, it cannot have any principles, filters, rules or definitions that simultaneously and directly refer to both pragmatico-semantic and prosodic information. The reason is that there would be no place in the grammar where these principles, rules and filters could be stated. This can be captured in a framework where phonological information, which is ultimately relevant for the interface of the grammar (in its wide sense) with Sensori-Motor Apparatus, i.e. the articulatory and auditory devices, is separated from syntactic (or syntactico-semantic) information, which ultimately feeds the interface of the grammar with the conceptual–intentional system. The standard T-model is such a framework, see (23).

(23) *T-model*



One of the motivations behind the T-model is that phonology is a module whose role is merely to interpret the output of the (overt) syntactic component for the Sensori-Motoric Apparatus.[11] As the reader will see, Erteschik-Shir and Strahov in their contribution argue against the T-model for precisely this reason. They claim that the grammar is best represented as an I-model, without a branching, and thus allow prosody and semantics to apply to the same representation.

[11] See for instance Miller et al. (1997) or Vogel and Kenesei (1990) for support.

Let us now go back to the stress–focus correspondence principle in (20). It is clear that it violates (22), as it refers to prosodic information and the LF notion focus at the same time. As we will shortly see, an approach, such as Reinhart's, has to give up the hypothesis of no direct PF–LF communication (cf. 21). At the same time, it maintains inclusiveness, as focus in this theory is not encoded in the syntactic computation where inclusiveness is supposed to hold.

Let us see whether the feature-driven account can be extended to account for (21) without violating (22). Although the standard account remained agnostic on the issue of focus-stress correspondence, it can be easily extended to account for the fact that in both English and Hungarian the focused constituent receives main stress. Let me use a tree-based metrical system to indicate stress placement (following Liberman, 1979 and Liberman and Prince, 1977). In this notation, each node in the structure is annotated with the labels Strong and Weak (S/W).[12] By definition, main stress is on the node that bears S and that is only dominated by nodes bearing S. To derive the fact that main stress falls on the focused element, all we have to assume is the following (Jackendoff, 1972: 241; cf. also Kenesei, 1998).

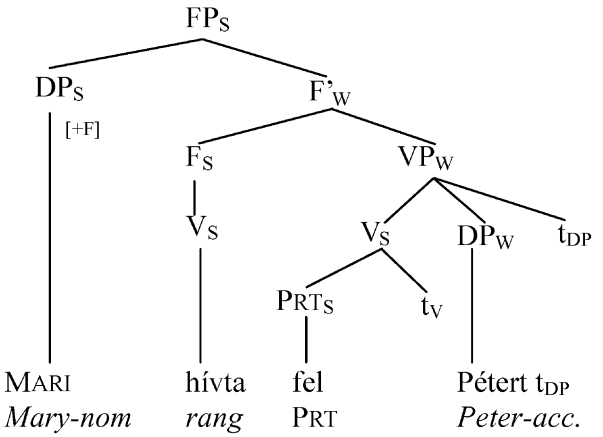
(24) *[+F] interpretation at PF*
Assign S to the node marked [+F] and to any dominating node.

As (25) and (26) illustrate, the feature-based analysis gives the right word order and the right stress pattern in both languages. In particular, the [+F]-marked element, *Mari* 'Mary', in (25) is marked S together with the only dominating node, the root node. This ensures that *Mari* 'Mary' receives main stress in (25). (See also Fn 8.) Similarly, the focused element bearing [+F] in (26), *the map*, is assigned an S label by (24), together with all the dominating nodes, such as the V, VP, I, IP, F' and FP nodes. As a result the focused element *the map* will receive main stress.[13]

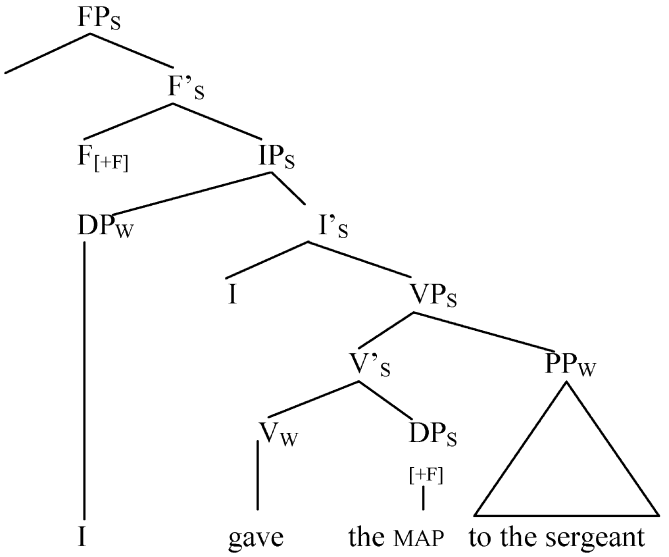
[12] The status of S/W annotation is not entirely clear. It could be that a node bearing S is really Strong, for instance in the sense similar to the notion of head of a phrase in syntax, i.e. an S node inherits properties of its S daughter. It could also be that S/W are best treated as prosodic features on nodes, then [+S]/ [+W] would be a more precise presentation. I chose to avoid this to avoid confusion with syntactic strong and weak features of Chomsky (1995), triggering overt vs. covert movement.

[13] Note that this brief sketch glosses over the issue of the existence of an independent nuclear stress rule. Two approaches are possible. First, the [+F] interpretation principle at PF, (24), only applies if an element with 'marked' focus is present, while in the neutral cases, a nuclear stress rule assigns an S label to the most deeply embedded (or rightmost) element and to all its dominating nodes, ensuring that unmarked stress falls on this element. This was Jackendoff's original proposal. Alternatively, one may assume that main stress is always defined by [+F], but [+F] is placed on the most embedded or rightmost element in the unmarked cases. Apart from empirical considerations, the choice between these two approaches raises conceptual issues, which are discussed in more detail in Zubizarreta (1998).

(25)



(26)



Thus, one may conclude that the feature-driven approach to focus is able to account for the basic syntactic and prosodic facts, while maintaining the hypothesis of no direct PF-LF communication. Nevertheless, this approach violates inclusiveness in the weak sense (cf. 16b) that the lexical item where [+F] is introduced into the derivation does not have any specific lexical property corresponding to [+F].

Recall that by (24) the terminal node marked by [+F] receives main stress. This appears to open up a way to circumvent the inclusiveness violation. One might argue that there is in fact a property of the lexical item where [+F] enters the derivation that is a result of the fact that it bears [+F], namely the property of bearing main stress. This is indeed a property of that node, but crucially, not a lexical one, and

thus it will not help to alleviate the inclusiveness violation. A grammar that has features and corresponding filters that encode properties such as unstressed, main stress, secondary stress etc., violates inclusiveness in the following sense. Chomsky remarks: 'standard theories take it [the inclusiveness condition] to be radically false for the computation to PF.' (Chomsky, 1995: Ch 4 fn 10) He further explains that syllable structure and intonation are clear cases where the inclusiveness condition does not hold.

Take main stress. It is not a *lexical* property of any lexical item that it bears main stress. Rather this property follows from its position in the prosodic structure). Assuming that there is a certain phonetic cue (or more than one) that is associated with prosodic prominence, there is no absolute value above which items are prosodically prominent and below which they are non-prominent. Rather an item is prosodically prominent if its value is greater than that of its neighbours (see Liberman, 1979 for the same claim).

So stress, just like focus, is not an absolute property of a node, but a relative notion. An element bears prosodic prominence with respect to another element that does not. Similarly, if an element is focused, the rest of the utterance is backgrounded (or presupposed).

5. The stress-based approach

Let us now go back to the very beginning. We started out by enumerating different schools of linguistics and briefly examining how they encode notions such as focus in the grammar. We have mentioned that the standard approach of the GB/minimalist school is the strictest in the sense that it hypothesises that focus is encoded in the grammar in the form of a syntactic focus-feature. In the nineties, it was established in works by Rizzi (1997), Bródy (1990, 1995) and many others, that at least certain languages have a unique, structurally defined Focus-position. Thus, they argued, the pragmatic notion focus is directly encoded in syntactic structure in an unambiguous fashion. In fact, the focus is marked in syntax by a focus-feature and by a unique structural position projected in the tree, the FocusP. All that happens at the interfaces is a one-to-one mapping: the constituent(s) marked as focus in the syntactic structure are identified as foci for purposes of semantic and pragmatic considerations. We established that prosodic phonological information has to be available at the interface, due to the stress–focus correspondence, and that it is only possible to encode such information into syntactic features if one violates the inclusiveness condition of Chomsky (1995: 228). Thus syntactic focus determines prosodic prominence. This state of affairs is consistent with the standard T-model, as there, in general, syntax feeds phonology and not the other way around.

Let us briefly consider an alternative approach, which I term the stress-based approach to focus. As we have seen above, an approach that wishes to maintain that the principle of inclusiveness holds in the syntactic derivation cannot encode the notion of focus as a syntactic feature. The alternative suggested by Reinhart (1995) and Neeleman and Reinhart (1998) is that it is the prosodic makeup of the

utterance, rather than its syntactic characteristics, that encodes focus in the grammar. In particular, in Reinhart's theory, focus is not encoded by a syntactic feature, rather the prosody of the utterance determines the possible foci in accordance with the stress–focus correspondence generalisation, repeated here for convenience.

(27) =(20) *Stress–focus correspondence*:
The focus of an utterance always contains the main stress of the utterance.

Reinhart (1995) and Neeleman and Reinhart (1998) follow Chomsky (1971), Cinque (1993) and Williams (1997) in viewing focus as a property defined on PF, by prosodic prominence. The architecture of the grammar has to be such that this information is available at the LF interface to identify the syntactic or pragmatic focus.

In particular, Neeleman and Reinhart (1998) argue that the focus of an utterance is determined by its intonation. A particular utterance may have more than one focus interpretations. They define the set of possible foci for a given utterance as follows.[14]

(28) The focus set of IP consists of the constituents containing the main stress of IP.
(Neeleman and Reinhart, 1998: 333, Ex. 51)

Thus the utterance in (29), where main stress falls on the object, has the focus set given in (30). Accordingly, it is felicitous in the context of the questions in (29) indicating IP, VP and DP_{DO} focus, respectively.

(29) a. A: What's this noise?
B: My neighbour is building a DESK.
b. A: What's your neighbour doing?
B: My neighbour is building a DESK.
c. A: What's your neighbour building?
B: My neighbour is building a DESK.
(Neeleman and Reinhart, 1998: 333, Ex. 53)

(30) Focus set: (IP, VP, DP_{DO})

In the stress-based approach to focus, the output of the grammar is an ambiguous utterance with more than one possible focus interpretation. Depending on the discourse conditions, one interpretation is chosen as the actual focus. However,

[14] See also Sperber and Wilson (1986/1995) and Breheny (1998) for a similar treatment in relevance theoretic terms.

discourse may only select a member of the focus set, and may not select a constituent outside the focus set. Thus the answer in (29a) is inappropriate in the context of the question in (31), as that context requires DP_{SU} focus, which is not in the focus set of the utterance. It is equally inappropriate in the context of (32), as that requires focus on the V, which is also not in the focus set of the utterance.

(31) A: Who's building a desk?
B: #My neighbour is building a DESK.

(32) A: Has your neighbour bought a desk already?
B: #No, my neighbour is building a DESK.
(Neeleman and Reinhart, 1998: 334, Ex. 54)

Neeleman and Reinhart (1998) argue that every language has a neutral, unmarked stress pattern, assigned by the nuclear stress rule (NSR). In English, the result of the NSR is main stress on the rightmost constituent, i.e. on the object in a transitive construction (cf. also Fn 12). If the focus set defined by the NSR does not contain the intended focus of the utterance, a special operation may apply to place stress on the constituent in question.

(33) Relocate main stress.
(Neeleman and Reinhart, 1998: 333, Ex. 55)

By (33), in the context of (34a), a marked stress (not the one assigned by NSR) is assigned to the DP_{SU}, and in (34b) to the V. As a result, the focus set of the utterance, defined by the main stress, contains the relevant constituents, and the utterances are appropriate in their given contexts. In fact, in their contexts, the utterances do not seem marked; they are perfectly natural.

(34) a. A: Who's building a desk?
B: My NEIGHBOUR is building a desk.
b. A: Has your neighbour bought a desk already?
B: No, my neighbour is BUILDING a desk.
(Neeleman and Reinhart, 1998: 334, Ex. 56)

Reinhart (1995) argues that there is a very precise sense in which the utterances in (34) can be viewed as marked. They both involve an optional operation, stress shift. Stress shift is an optional operation in the sense that performing the operation is not necessary to save the derivation from crashing at the interfaces. Stress shift does not apply to turn an otherwise ill-formed expression into a well-formed one, as for instance movement of the object to [Spec, TP] in English passives does. Rather, the utterance would be well-formed even if stress shift did not apply. Nevertheless, such

optional operations are not totally unrestricted. Reinhart argues that they apply if and only if they have an effect on the interpretation. In other words, such operations can be viewed as marked in the sense that they lead to ungrammaticality unless they derive an interpretation that was otherwise unavailable. This intuition is formalised in the following definition.[15]

(35) *Economy violation*:
Take fully derived (syntactically and prosodically) structures D_i and their interpretations I_i as ordered pairs. $<D_1, I_1>$ is ruled out as an economy violation if and only if there exists $<D_2, I_1>$, and D_2 involves fewer operations (syntactic or prosodic) than D_1.
(cf. Reinhart 1995: 48)

To illustrate how economy operates, compare the exchange in (34a) with the infelicitous exchange in (36).

(36) A: What's this noise?
B: #My NEIGHBOUR is building a desk.

The same utterance is appropriate as an answer to a question that requires subject-focus (cf. 34a), but it is inappropriate as an answer to an all-focus (i.e. IP-focus) question (cf. 36). The stress shifting operation that places stress on the subject is legitimate under a reading that puts focus on the subject, as subject focus was not available unless stress strengthening applied to the subject. The same operation is, however, illegitimate under a reading such as the all-focus-reading, because there exists an expression, the neutrally stressed utterance (29a), where the optional operation did not apply and where the same all-focus-reading is available. In this way, Neeleman and Reinhart (1998) account for the well-known generalisation that wide focus readings (i.e. focus on a constituent larger than the stress-bearing element) are blocked from certain positions (see Selkirk, 1984, 1986 and many others).

To summarise, Neeleman and Reinhart (1998) argue that the set of possible foci of an utterance is determined by the main stress of the utterance. If focus is required on an element that is not in the focus set of the unmarked utterance, where stress is assigned by the NSR, then an optional stress strengthening operation may assign stress to the element, to make it available in the focus set of the marked utterance. Reinhart's approach gives the following answer to the question whether focus is directly and unambiguously represented in the syntactic representation. The set of possible foci, rather than the actual focus of the utterance, is determined by the

[15] For reasons of space I cannot go into a more detailed discussion of the issue of economy, but I would like to point out that as I discussed in Szendrői (2001), economy considerations cannot be circumvented in a feature-based theory of focus either. Thus, no conceptual argument can be formulated that would favour the feature-based view on grounds that it does not assume economy considerations.

grammatical representation of the sentence, where grammatical representation is understood in the wider sense of including the prosodic representation as well as syntactic structure.

Thus a characteristic difference between the feature-driven approach and the stress-based approach is that the former determines the unique and unambiguous focus of the utterance, while the latter defines the set of possible foci. The actual focus is selected from this set by the discourse context. Another difference is that focus is encoded syntactically in the former, but not in the latter. Thus, the stress-based approach maintains Chomsky's inclusiveness principle, but as a result of encoding focus–stress correspondences directly in the grammar, it does so at the cost of giving up the hypothesis of no direct PF–LF communication.

Stating the stress–focus correspondence principle at the interface means that prosodic marking of focus should be universal. Thus, the stress-based theory makes a strong and easily falsifiable prediction. Namely, there is no language where focus is marked *only* by a specific syntactic position without prosodic marking (stress or tone). Xu, in his contribution in this volume, argues that although certain constructions in Chinese support Reinhart's (1995) theory, certain other constructions challenge the universality of her claim in precisely this sense.

A final consequence of the stress-based approach to focus that I would like to mention is that it does not assume that there is syntactic movement related to focus overtly or covertly.[16] Thus, it does not run into difficulties accounting for cases like focus inside islands (cf. 6 above) and backward-and-down anaphora (cf. 7 above). Note that this of course means that the ungrammaticality of the original weak crossover cases of Chomsky (1976) remains unexplained (cf. 4b above). As a further consequence, the stress-based approach does not readily account for a parallel between *wh* and focus. However, if focus does not trigger movement, then the syntactic parallel breaks down. To the extent that there is a semantic parallel, this can be easily accommodated in a stress-based approach to focus as well.

In the previous sections I gave a description of two opposing views on the nature of the interface: the feature-driven approach and the stress-based approach. I argued that the former violates Chomsky's (1995) inclusiveness, while the latter is forced to allow direct PF–LF communication in the grammar.

6. Overview of the volume

In this final section I would like to introduce the papers in this volume in the light of the discussion above. The papers represent a range of views with respect to the status of the interface. On the one hand, Speas argues for a direct syntactic encoding of pragmatic notions such as evidentiality and logophoricity. On the other, Junker, Pereltsvaig and Kennelly discuss issues that cast doubt on the direct syntactic encoding of pragmatic notions and thus argue for a more elaborate interface.

[16] See Szendrői (1999, 2001) for a reanalysis of Hungarian focus fronting in the stress-based theory of focus.

Erteschik-Shir and Strahov argue for a new level of representation in the grammar to accommodate the discourse-grammar mapping. Xu questions the universality of Reinhart's (1995) stress-focus correspondence principle.

Speas explores the mapping between syntax and pragmatic features in the domains of evidentiality and logophoricity. Logophoric pronouns refer to individuals whose point of view is being represented. Evidential markers mark the speaker's source for the information being reported in the utterance. In particular, Speas shows that evidential markers are restricted to four distinct kinds, which form a scale with respect to the degree to which the evidence directly involves the speaker's own experience. She argues that such restrictions do not follow from any obvious conceptual considerations, and seem rather arbitrary from a pragmatic point of view, suggesting that it is either the case that pragmatics is more hierarchically organised than previously thought (i.e. the pragmatic notions corresponding to the different levels of the restrictions themselves form a hierarchical scale) or that evidential markers are regulated by syntax proper, where such a hierarchy is readily available. Then she considers logophoric pronouns and shows that the hierarchy of logophoric contexts inversely correlates with the hierarchy of the categories of evidentiality.

She claims that the behaviour of both evidentiality and logophoricity (and their interaction) can be made to follow if one assumes the Cinqueian hierarchy of pragmatically motivated functional projections at the left-edge of the sentence and that an implicit subject *pro* sits in the Specifier of each projection The assumption that these pragmatic notions are syntactically encoded is further evidenced by the fact that evidentiality and logophoricity interact with syntactic notions such as person agreement in Tibetan and Akha and tense marking in Sherpa. The fact that these projections are very high in the functional hierarchy accounts for the fact that logophoric contexts exclude subject control into infinitival clauses, further evidencing the syntactic view of these pragmatic notions.

Xu shows that the sentence-final position, also the most deeply embedded position on the recursive side of branching, is the default position for informational focus in Chinese. In Chinese the focused element takes the default focus position unless structural considerations exclude that possibility. He argues that in this case, but only in this case, prosodic prominence is applied to mark focus on a constituent that cannot occur in the default position due to some structural limitation. Thus, he argues that Reinhart's (1995) stress–focus correspondence principle (see 20 above) cannot be a language universal. Rather, adopting Cinque's (1993) proposal, he proposes that all languages indicate unmarked focus by the default most embedded position, which is sentence-final in VO languages.[17] In addition, languages are parametrised with respect to the optionality or obligatoriness of prosodic focus marking, i.e. Reinhart's stress–focus correspondence: in English and some other Indo-European languages, prosodic focus marking is obligatory, while it is optional in Chinese, and therefore omitted unless necessary to identify the focal constituent.

[17] See Szendrői (1999, 2001) for a discussion of Hungarian stress and focus for a potential counter-example to this universal. There it is argued that the unmarked position of main stress in Hungarian is left-peripheral, rather than right-peripheral, even though Hungarian is a VO language.

Erteschik-Shir and Strahov argue for syntactic representation of focus (and topic) in terms of a feature, but not in terms of a syntactic functional projection. They argue that there is a level of representation after narrow syntax, f-structure, where FOCUS and TOPIC features are assigned to the output of narrow syntax. At the next stage, in P-syntax, these features (and possibly others) may be checked. (See also Zubizarreta, 1998 for a similar approach.) P-syntax differs from narrow syntax in several respects: (i) topic and focus constituents as well as the edges of the largest constituent are available in P-syntax. Thus hierarchical structure is only partially and indirectly carried over to P-syntax. (ii) movement at P-syntax is triggered by f-structure features (i.e. TOPIC, FOCUS); (iii) movement in P-syntax targets the edges rather than a c-commanding landing site; (iv) in P-syntax the configuration for checking is adjacency rather than [Spec, head]. Once f-structure features are checked, the output of P-syntax is carried over to semantic and prosodic interpretation, i.e. scope is determined here and intonation is assigned to this representation. As a result, there is no separate LF component or an independent nuclear stress rule (i.e. main stress is assigned to the constituent(s) marked FOCUS). This means that they argue for a new architecture of the grammar: instead of the standard T-model, discussed above, they argue for a non-branching I-model.

This approach represents a mixed view with respect to the questions investigated here. On the one hand, at the level of focus structure utterances are unambiguously encoded with respect to information status. In this respect, this approach is closer to the feature-based view of focus. On the other hand, the analysis identifies certain phenomena as prosodically motivated movement operations. They argue that these operations have to be distinguished from the other syntactic movement operations, and therefore argue that the two different types of movement operations apply at the different levels of representation. Ordinary feature-driven movement operations apply at the level of narrow syntax before f-structure, and prosodically-driven movement operations apply after it, in p-syntax. Notions such as spec-head configuration and fully-fledged hierarchical structure characterise the former, while notions such as edges and adjacency are relevant at the latter.

Using this system, Erteschik-Shir and Strahov provide an account for Scandinavian object shift, assuming that pronominal or topical objects in these languages are clitics and incorporate into a suitable host such as the verb. As a consequence, in just those cases where the host of the object is the verb and the verb undergoes movement due to V2, the object is carried along as a 'free rider'. The system also accounts for scrambling in Russian. In Russian the focal constituent is at the right-edge of the VP.[18] P-syntactic scrambling, then, is triggered by the need to place the focal constituent into this position. Erteschik-Shir and Strahov admit that their proposal violates Chomsky's inclusiveness condition, and propose that such violations should be limited to FOCUS and TOPIC.

The remaining papers put forward theoretical as well as empirical considerations that cast doubt on a direct encoding of pragmatic notions into syntax. In the light of these arguments, one may be inclined to argue that pragmatic information is

[18] See also Pereltsvaig's contribution for the same claim.

indirectly and ambiguously represented in the syntactic structure. Junker, Pereltsvaig and Kennelly argue for considerable independence between syntax and pragmatics.

Some of the arguments presented in these papers are based on observations that pragmatic notions are ambiguously represented in syntax, thus making it unlikely that they are directly represented at all. The question that arises then is the following: In what ways are focus and other pragmatic notions defined at the interfaces? According to Pereltsvaig, linear positioning (i.e., being at the left- or right-edge) determines the discourse status of an element. In particular she argues that the right-most element in the Russian clause is the focus, while topics are located at the left-periphery. Both Pereltsvaig and Junker follow the Prague school-view in arguing that topic-focus articulation and/ or the notion of left- and right-edges have to be available in the syntax.

Note that the various analyses presented in this part of the volume raise theoretical issues in their own right. Some of the authors make assumptions which enrich the power of the grammar considerably. Notably, Junker argues that 'alignment' may play a role in the grammar. Pereltsvaig claims that 'linearity' and 'topic-focus articulation' are grammatical notions. It remains to be seen whether such powerful assumptions are justified. The papers are summarised below.

Pereltsvaig argues against the direct syntactic encoding of topic and focus in terms of designated syntactic positions. Instead, she argues that in Russian and Italian topics are always leftmost, but do not necessarily sit in the same syntactic position. Contrastively focused constituents on the other hand, she argues, following Samek-Lodovici (1996), are right-most in these languages. Here too, she shows that the syntactic position of the focal element is not always the same.

Pereltsvaig further argues that in cases where the focused element is not string-final, post-focal material is either right-dislocated or IP-external. She supports this view by prosodic and phonological arguments showing that post-focal material has all the common prosodic characteristics of right-dislocation and that certain phonological rules, such as resyllabification, that are known to apply on the IP-level do not apply across the focal element and a subsequent post-focal element. She concludes that since focus and topic are aligned with the edges of the IP, thus defined linearly, rather than hierarchically, and since they do not sit in unique designated positions, it is counterintuitive to encode these notions in terms of syntactic functional head positions.

Junker provides evidence from the Algonquian language, East Cree, that obviation, or non-topicality can affect word order. Thus, she provides a new case for pragmatically-constrained syntax. It has been known for a long time that focus, topic and similar discourse notions may affect word order in so-called non-configurational languages (cf. É. Kiss, 1995), but this is the first example of a language where word order is affected by obviation or non-topicality.

Junker also shows that contrastive focus[19] (but not new information focus) occupies a left-peripheral preverbal position. She shows that in the word order of

[19] She follows the terminology of Vallduví and Vilkuna (1998) and calls 'contrastive focus' a case of 'focus/ kontrast' as opposed to 'new information focus' or in her terminology 'focus/ rheme'.

East Cree this focus requirement interacts with the obviation constraints in an intricate way. She also demonstrates that an analysis in terms of a fully-fledged topic-focus functional structure at the left-periphery would leave certain word order restrictions unexplained. Consequently, she argues for pragmatic constraints such as the focus constraint and the obviation constraints to have a direct effect on the syntax of East Cree in the form of alignment of hierarchies.

Kennelly shows that the pragmatic notions new information (or focus) vs. given determine certain readings of indefinites under quantificational dependencies. On the basis of Turkish data, she puts forward a position where semantic scope considerations would be dependent on pragmatic information, rather than encoded in the syntactic computation by covert movement. Thus, she argues against any form of quantifier raising.

7. Conclusion

To sum up, the papers in this volume investigate the following questions. Is it the case that focus and other similar pragmatic notions are represented in the syntax directly? Is there a unique focus-position or focus-feature in the clause? And is it thus the case that focus (and some other pragmatic notions) can be 'read off' from the syntactic representation in an unambiguous fashion? Or is it rather the case that syntax merely provides a structure which may be interpreted pragmatically in a number of different ways? If so, we may assume that focus is determined at the interface(s), not directly from syntactic structure. Thus, at least in principle, we allow for phonology (and maybe semantics) to feed into different focus patterns; which in turn raises questions about how and to what extent phonological information can affect pragmatic representations at the interface(s). Finally, it should be investigated whether the proposed ways of encoding or representing focus and similar pragmatic notions in the grammar are sufficiently restricted. The various answers provided by the papers demonstrate the range of views available on the interface between structure and interpretation.

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