

# On information structure, meaning and form: generalizations across languages

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## 1. The outset

Over the past four decades, the syntactic and prosodic properties reflecting the information packaging of a particular sentence have attracted considerable attention in the field. Most linguists working in the generative framework will agree that there are language-specific phenomena concerning information structuring, such as focus, topic and intonation, and that they can only be adequately described with reference to a specific theoretical framework, or model of grammar. However, they will disagree on exactly how this grammatical model must be conceptualized in order to derive the relevant syntactic form with the appropriate intonation and the intended semantic and pragmatic meaning. This book takes up the issue of how the grammar of human language should be modeled to account for linguistic information packaging and interrelated issues such as word order variation and speech act type. The fundamental issue it addresses is the interaction between the linguistic form of information structuring and its interpretation across languages.

The term *Information Structure* (IS) of a sentence refers since Halliday (1967) to the linguistic encoding of notions such as focus versus background and topic versus comment, which are used to describe the information flow with respect to discourse-givenness and states of activation. Examples (1B1-B5) below each provide the same constituent as the foregrounded information, despite certain variations with respect to word order, particles, length, or elaboration. Foregrounded, or focused, constituents are often prosodically highlighted, as signaled by capitalization from now on.

- (1) A: What did John bring to the party?  
B1: He brought PAELLA to the party.  
B2: He brought only PAELLA to the party.  
B3: He brought PAELLA to the PARTY and COOKIES to the RECEPTION.  
B4: Only PAELLA did he bring to the party.  
B5: (Only) PAELLA.

This functional similarity is generally attributed to the fact that all of these responses serve as felicitous answers to the same question, which requires the specification of the contribution which John brought to the party. The subject *paella* is the constituent which corresponds to the *wh*-phrase in (1A), providing the missing information in the answer. This constituent, which is intonationally highlighted by the main accent, is generally referred to in the literature as the *Focus* of the sentence.

The complementary notion, illustrated by the constituents *he* or *John* in examples (2B1-B2), is referred to as the *Topic*. In most approaches, the term topic generally refers to a sentence-initial constituent which is predicated about. In (2B), the predication *brought paella to the party* is about the subject of the sentence, which is usually intonationally unmarked (cf. Reinhart 1982 and Portner, this volume).

- (2) A: What did John bring to the party?  
B1: He brought PAELLA to the party.  
B2: John brought PAELLA to the party.

Examples (3) and (4) provide evidence for the linguistic relevance of the notions focus and topic. In particular, examples (3B1) and its reduced version (3B2) show that the violation of focus constraints imposed by the heuristic question-answer test leads to infelicitous question-answer sequences. Both expressions, however, would be appropriate answers to a question such as *Who brought paella to the party?*

- (3) A: What did John bring to the party?  
 B1: #JOHN brought paella to the party.  
 B2: #JOHN.

The infelicity of (3B1-B2) as answers to (3A) results from the violation of the information exchange principle, which states that in an information exchange context, a sentential expression must mark non-discourse-giveness by linguistic focus marking. The response in (3B1) is infelicitous because *John* is prosodically focus-marked, although it is discourse-given, and (3B2) is infelicitous because *paella* is not focus-marked, in fact, not even phonologically realized, although it is not discourse-given. Example (4B1) illustrates a violation of the topic constraint: constituents which are already introduced into the discourse are deaccented and preferably realized as a pronoun. A rising accent on *John*, marked by the slash in (4B2), signals that the topic *John* is contrasted with an alternative topic (cf. Féry, this volume, and Hetland, this volume).

- (4) A: What about John?  
 B1: #JOHN brought PAELLA to the party.  
 B2: /JOHN brought PAELLA to the party.

As seen in (1) to (4), focus and topic are linguistically relevant information structural notions in that they mirror information packaging constraints in the formal realization of sentences. However, different languages use different strategies in encoding these notions. The most important means of expressing focus in English is intonation. This also holds true for German, which together with many other European languages belongs to the intonational focus marking languages:

- (5) A: *Was hat Hans zur Party mitgebracht?*  
 what has Hans to the party brought  
 'What did John bring to the party?'  
 B1: *Er hat PAELLA zur Party mitgebracht.*  
 he has paella to-the party with-brought  
 'He brought paella to the party.'  
 B2: *Zur Party hat er PAELLA mitgebracht.*

Hungarian, in contrast, is a language which is often described as having a designated syntactic position for a specific kind of focus – the identificational focus. This focus type is possible only in the immediate preverbal position (see Surányi, this volume, and Wedgwood, this volume).

- (6) *János MARIT hívta meg.*  
 János Mari.ACC invited VM  
 'It's Mari who János invited.'

Although many differences exist, the topic is often realized in sentence-initial position, as in English (2B), German (5B1), and Hungarian (6), where it must be realized to the left of the focus, preferably sentence initially. In Romance languages, the topic can be realized at the right periphery of the sen-

tence, as illustrated by the Italian example in (7) (see the contributions by Abraham, Breul, Molnárfi, and Frascarelli & Hinterhölzl in this volume).

- (7) *Non riesco a darmela da sola la conferma.*  
 not can.1SG to give-to.me(CL)-it(CL) alone the check  
 ‘I cannot make this check on my own.’  
 (example from Frascarelli & Hinterhölzl, this volume)

Some languages use still other means for topic and focus marking. In Japanese and Korean, for instance, morphology is responsible for signaling the focus or topic status of constituents. In the Japanese example (8a), the particle *wa* functions as topic marker and the particle *ga* as focus marker (cf. Kuno 1973). In the Korean example (8b), the unaccented particle *nun* marks the aboutness topic of the sentence (cf. Choe 1995, and Hetland, this volume).

- (8) a. [*Jono hon wa*] [*John ga*] *yonda.*  
 the book TOP John FOCUS reads  
 b. *Chelswu-nun CA- N- TA.* (Choe 1995: 282)  
 Chelswu-TOP sleep-PRES-DEC  
 ‘Speaking about Chelswu, he is SLEEPING.’

The question arises whether all syntactic highlighting, here referred to as focus marking, corresponds to non-discourse-givenness, as has been suggested with respect to the answers in (3). For particular languages such as, for instance, Hungarian (see (6)) and Hausa (see (9B)), it has been suggested that dislocations need not necessarily have the interpretation of non-discourse-givenness (cf. Wedgwood, this volume, for the interpretation of preverbal elements in Hungarian, and Hartmann & Zimmermann, this volume for the emphasis interpretation of *ex situ* elements in Hausa). More specifically, Hartmann & Zimmermann argue with respect to (9), their example (38), that the complete utterance of (9B) is focused, despite the fact that only the subject is moved to an *ex situ* position.

- (9) A: *Mèe ya fàaru?*  
 what 3SG.REL.PERF happen  
 ‘What happened?’  
 B: *B’ÀRÀAYII nèe su-kà yi mìn saatàa!*  
 robbers PRT 3PL-REL.PERF do to.me theft  
 ‘ROBBERS have stolen from me!’

There is a tremendous amount of empirical evidence from many different languages which shows that topic and focus and related phenomena are universally represented and which therefore requires a unified explanation. But there is still no agreement on how the different findings should be integrated into a coherent theoretical framework. This volume contributes to the task of modeling such a framework by bringing together papers which contribute a new perspective to the study of information structure and bring us closer to the goal of deriving relevant generalizations for an information structure theory. The core issues center on the questions of how information structural notions like topic and focus are represented at the levels of syntax, semantics and phonology and how they are related to pragmatics. The researchers adopting the grammar view are further divided over the issue of whether topic and focus are represented as syntactic features with interpretational reflexes in phonology and semantics, or whether these notions must be understood as exclusively phonological features.

The volume reflects the cooperation of a group of researchers with syntactic, semantic, phonological, and pragmatic backgrounds whose recent investigations have concentrated on three major research areas, each of which raises challenging questions:

i. *Information structure and grammar*: At the core of this research area are fundamental questions like the following: How do syntax, phonology and semantics interact in information structure related accounts of different languages? What counts as linguistic evidence for the existence of topic, focus and related information structural notions? What are typologically and crosslinguistically relevant pieces of evidence for the characterization of information structural terms? That is, do focus, topic, and rheme exist as grammatical categories and how do they reflect the dichotomies such as focus versus background, topic versus comment, and rheme versus theme?

What exactly is the relation between form and meaning? And more precisely, are the pragmatically based notions like topic and focus generally encoded as syntactic features which correspond to semantic and prosodic properties? Or can these notions be directly related to prosody and to meaning? And if yes, what does this imply for the architecture of grammar?

Little work has been done to define the term information structure. What exactly does the term information structure denote? Is it a cover term for focus-background structure or the topic-comment structure (cf. Chomsky 1971, Dahl 1974, Kiefer 1977, Jacobs 1984, Drubig 1991/1992, Lambrecht 1994 and Portner's account, this volume)? Or should it be conceived of as an independent level? Most papers in this volume view information structure as an interface level between two or more components. The contribution of this book is to specify its relevant interface conditions.

ii. *Information structure and pragmatics*: The central questions which define this research area are the following: How do the grammatical components proper interact with the pragmatic component and discourse grammar? What exactly is the relation between grammatically determined meaning and pragmatic meaning? Is there a pragmatically determined information structure interface, which is fed by grammar and extralinguistic knowledge? If yes, how can the conditions which operate at this interface be made more precise?

iii. *Information structure and typological generalizations*: Fundamental to this research area are questions the answers to which show that information structural constraints might operate universally: What are the possible ways of characterizing and classifying topic and focus and their information structural function in a typologically relevant way? More precisely, what are the universal principles which determine the syntactic, phonological, semantic and pragmatic representation of information structural notions?

The main goal of this volume is to provide initial answers to the questions raised above. The three identified research areas determine the structure of this introduction. We start out by providing further insight into the state of the art and preliminary work in each research field. Section 2.1 investigates the interaction of information structure with the core components of grammar. Section 2.2 discusses the interaction of information structure with the component of semantic-pragmatics. Section 2.3 concentrates on longstanding questions and new contributions. In section 3, we group each paper according to its central contribution to one of the research areas.

## **2 The formal approach and the interpretive approach**

In recent linguistic research on information structure, meaning and form, two central approaches can be identified: the formal view and the interpretive view. The former comprises (i) the syntactic or feature-based account and (ii) the phonological or prosody-based account. The latter, often also referred to as the semantic-pragmatic view, comprises (i) the one-to-one mapping account of grammatically determined meaning onto pragmatic meaning and (ii) the semantic underspecification account. The two views and their theoretical implications are compared and evaluated from a typological perspective.

The articles in this volume are summarized and grouped with respect to this discussion.

## 2.1 *The formal approach: Syntax and prosody*

### 2.1.1 *Focus: Arguments for a syntactic implementation*

Within the formal theory, the feature-based approach assumes that the information structural notions topic and focus are integrated into the formal system of language. According to the standard variant of this theory, a formal f(ocus)-feature is introduced at some level of the representation and causes the f-marked phrase to move to the specifier position of a corresponding functional focus head, which is projected in the left-peripheral domain of the sentence (Rizzi 1997, É. Kiss 1998). The f-feature is translated at the phonological form (PF) into prominence according to specific phonological rules and at the logical form (LF) into a semantic representation. Within this theory, information structural notions are directly and unambiguously represented in the syntactic component and translated at the two interpretive interfaces.

This type of approach was developed by Chomsky (1972) and Jackendoff (1972) and has been argued for within Generative Grammar and Minimalism since. Influenced by early phonological work by Chomsky & Halle (1968) and Halliday (1967), Chomsky (1972: 91) defines focus as “the phrase containing the intonation center.” He further concurs with Halliday in the assumption that the focus constituent represents new information; therefore, the accent on *garden* in (10b) signals a focus constituent, which is accordingly interpreted as new information:

- (10) a. Does John write poetry in his STUDY?  
 b. No, John writes poetry in the GARDEN.

Chomsky further argues that the part of the sentence that is not focused is presupposed. He defines the *presupposition* as that part of the sentence “determined by replacement of the focus by a variable” (p. 91). Thus, Chomsky’s focus-presupposition account can be formalized as in (11):

- (11) a. Focus: The foci  $F_1 \dots F_n$  in S are identified by accent location.  
 b. Presupposition: Given a sentence S and its foci  $F_1 \dots F_n$ , replace each  $F_1$  in S with a variable  $X_1$ .

Turning against the assumption that focus is directly correlated with accent, Jackendoff (1972: 240) introduced for the first time an independent syntactic feature F, which receives both a phonological and a semantic interpretation: “Two systems of rules will make use of the marker F, one in the semantics and one in the phonology.” Since Jackendoff is primarily interested in explicating the semantics of focus, he bases his analysis on Chomsky’s focus-presupposition account and proposes that the semantic representation of an example like (12) consists of three steps: First, a one-place predicate *Presupp<sub>s</sub>* is formed by replacing the focus with an appropriate semantic variable  $x$ . The second step requires that the focus be a member of the presuppositional set to yield a true proposition ( $\text{Focus} \in \lambda x \text{ Presupp}_s(x)$ ). The third step involves constructing the presupposition in (12a) and the assertion in (12b) from the presuppositional set (cf. Jackendoff 1972: 245f.):

- (12) John LIKES Bill.

- a.  $\lambda x \left[ \text{the} \left\{ \begin{array}{l} \text{relation between John and Bill} \\ \text{attitude of John toward Bill} \end{array} \right\} \text{is } x \right] \left\{ \begin{array}{l} \text{is well-defined} \\ \text{is under discussion} \end{array} \right.$
- b.  $\left[ \left\{ \begin{array}{l} \text{relation between John and Bill} \end{array} \right\} \right]$

In Jackendoff's speaker-hearer model, (12a) is interpreted as 'we are talking about possible relations between John and Bill or attitudes of John toward Bill', and (12b) would specify that *like* is one of the relevant relations. Jackendoff incorporates his view that focus is not directly correlated with accent into the rule of focus assignment (cf. Jackendoff 1972: 247), which annotates the syntactic structure and serves as input to both semantic and phonological interpretation. Phonological rules assign the pitch accent to the constituent that carries the focus feature according to the *Nuclear Stress Rule*. Interpretive rules of the semantic component assign an interpretation to the focus-marked constituent, yielding the presuppositional set. Thus, by proposing a focus-annotated surface structure, later referred to as *focus structure*, Jackendoff's proposal stands as the first approach that satisfies the requirements of a modular grammatical model.

All of the subsequent syntactic information structure theories analyze focus as a syntactic feature. The main argument for the assumption that focus should be encoded in syntax comes from focus movement facts. Chomsky (1976) proposes that focused phrases must form an operator-variable LF representation. The central argument for quantified focus structures at LF is based upon the observation that *weak crossover effects* are responsible for the ungrammaticality of sentences such as (13a, b). No violation, however, is caused by focus raising in (13c).

- (13) a. \*The woman  $he_i$  loved betrayed someone $_i$ .  
 b. \*The woman  $he_i$  loved betrayed JOHN $_i$ .  
 c. The woman  $he_i$  loved BETRAYED John $_i$ .

According to Chomsky (1976), the pronoun *he* and the referential expression *John* can be coreferential in (13c), since in this case *John* has not been moved and the binding conditions are not violated at S-structure.

Although Chomsky's (1976) arguments have been subject to discussion (see Rochemont 1978, 1986, Solan 1984, Horvath 1985, Horvath & Rochemont 1986), the general observation of focus raising in (14) is found in many subsequent works.

- (14) *Focus Raising*  
 [<sub>FP</sub> ...  $\alpha_i$  [<sub>CP</sub> ...  $t_i$  ... ]]  
 [+focus]

This rule proposes that focused elements are raised at LF and are adjoined to a left-peripheral sentence-initial position. These quantified structures, which identify the focus constituent, are the input to focus interpretation rules, which operate as well-formedness conditions on discourse structures.

Drubig (1994, 2003) and Krifka (2006) participate in the debate on whether association with focus is a syntactic phenomenon or a purely semantic one. Within the semantic association-with-focus theories, Rooth (1985) and Kratzer (1991) have argued explicitly that the association between the focus-sensitive particle and the focused element does not involve any movement. In Rooth (1992), the association falls out from the focus interpretation principle (Rooth 1992: 85f.), which specifies that "if C is the domain of quantification of a focusing adverb with argument  $\alpha$ , then the contrasting set C is a subset of the focus semantic value of  $\alpha$  ( $C \subseteq \llbracket \alpha \rrbracket^f$ )." Kratzer (1991) uses example (15) to show that *only* and the NP *zoning board* cannot be associated via movement because island violations would be expected.

- (15) They only investigated the question whether you know the woman who chaired the ZONING board.

Within the syntactic theories that implement association with focus there are basically two proposals: either the focus-sensitive operator, which forms a syntactic constituent with the focus constituent in its base-generated position, moves to a non-adjacent position from which it can c-command the contrastive focus (e.g., Brody 1990, É. Kiss 1998), or the focus itself moves to a sentence-initial position, where it is associated with a focus-binding element, as in Chomsky's (1976) original work. Drubig (1994) argues with respect to Kratzer's (1991) example that focus movement moves not only the pitch accented element but the complete focus phrase. He employs as a test tool the negative contrastive construction, which reveals that *only* is associated with the highest DP (DP<sub>1</sub>), as shown in (16):

- (16) They only investigated [<sub>DP1</sub> the question of whether you know [<sub>DP2</sub> the woman who chaired [<sub>DP3</sub> the ZONING board.]]]
- a. \*not the SCHOOL board.
  - b. \*not the woman who chaired the SCHOOL board.
  - c. not the question of whether you know the woman who chaired the SCHOOL board.

Based on these observations, Drubig (1994) argues that in languages like English and German the contrastive focus phrase moves at LF, namely into the Spec position of a sentence-initial focus phrase.

In a recent paper, Krifka (2006) again takes up the question of whether association with focus is a structural operation involving LF movement, or an interpretational operation. Contrasting the structured meaning approach and the alternative semantics approach he argues for a hybrid association-with-focus approach which is more complex than either the simple alternative semantics or the simple structured meaning approaches. The central claim is that the association with focus phrases takes place via LF movement, while the association of focus within focus phrases occurs via the projection of alternatives. Insights from explicit contrasts, multiple foci in syntactic islands and elliptical answers to questions provide more solid evidence for island restrictions in association with focus.

### 2.1.2 *Topic and focus positions*

In the last decade the syntactic account of information structure has concentrated on two topics: First, what is the exact structure of the left periphery and how is it defined? Second, is the assumed structure and recursiveness of the left periphery universal? The central idea of Rizzi's (1997) proposal is that the C-system is made up of two parts, the ForceP and the FinP. The former establishes the relation of the clause to the context and contains information about the sentence type, either by overt morphological encoding or by providing an operator position of the required type. The latter establishes the relation to the TP embedded under the C-system. The head of the FinP carries the finiteness features, which are related to mood distinctions, tense distinctions, etc. The TopP and FocP are sandwiched between the ForceP and the FinP, as in (17):

- (17) [<sub>ForceP</sub> [<sub>TopP</sub> [<sub>FocP</sub> [<sub>FinP</sub> [<sub>TP</sub> ... ]]]]]]

Rizzi (1997: 288) proposes with respect to (17) that "it is reasonable to assume that the topic-focus system is present in a structure only if "needed", i.e. when a constituent bears topic or focus features to be sanctioned by a Spec-head criterion." Thus, in agreement with Rizzi's (1990) general well-formedness condition for syntactic operators and Brody's (1990) *Focus Condition*, topic and focus must be operators that are only licensed if they occur in a specifier-head configuration.

Recent syntactic accounts have discovered two main areas in sentential structure in which structural topic and focus positions are located. As Rizzi observes, most Romance languages exhibit movement of focused constituents to a position within the CP area. However, a vast number of typologically unre-

lated languages like Hungarian (É. Kiss 1998), Hebrew (Belletti & Shlonsky 1995), Kirundi (Ndayiragije 1998), Georgian (Bush 2000) and Malayalam (Jayaseelan 2001) have a structural focus position in the vicinity of the verb phrase. For English it is generally assumed that only the CP area can be the target of focus movement (cf. Breul 2004 for recent discussion). However, considerable language-particular and typological evidence from different types of constructions has been collected in recent years which suggests that an additional clause-internal focus position is available in English. Recent developments in the minimalist program make reference to the notion of *phase*, which is defined as “the closest syntactic counterpart to a proposition” (Chomsky 2001). A phase is identified concretely as the predicate phrase (vP, the constituent which encodes the full argument structure of the predicate) and the sentential constituent (CP, semantically a proposition). Starting with initial insights by Kayne (1998), who proposed that focus operators move to a position which is at the edge of vP, further evidence was found that suggested that movement was phase-bound (Fox 2000 and Chomsky 1999, 2001, 2002, 2005). The central claim in current syntactic theory is that dislocation is always leftward, either to the left edge of the sentence or to the left edge of the predicate phrase. Drubig (this volume) proposes the typologically relevant *isomorphism hypothesis*, which captures the fact that derivational phases have identical structure. Therefore, information structural positions must occur both at the left edge of the smaller vP-phase and at the left edge of the clausal phase.

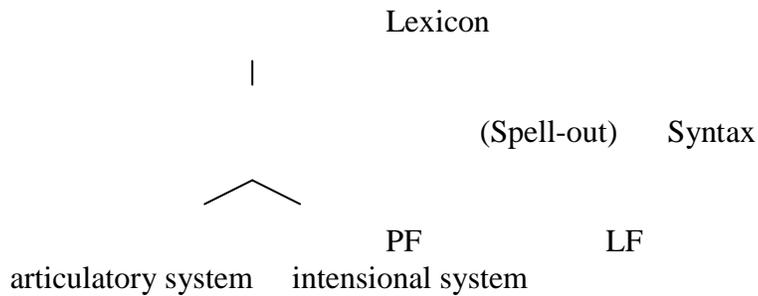
In recent influential work on the order of topic and focus, Hetland & Molnár (2001) propose that the order follows two universal information structuring principles: i. the *Topic First Principle*, which determines that information which is connected to the preceding discourse comes first (cf. Gundel’s (1988) *Given Before New Principle*, Tomlin’s (1986) *Theme First Principle*, and Herring’s (1990) *Discourse Iconicity Principle*), and ii. the *Focus First Principle*, which determines that the most important information comes first (cf. Gundel’s *First Things First Principle* and Mithun’s (1987) *Newsworthiness Principle*). The two principles are not contradictory if the complementary part of the topic, the comment, contains the focus, which, in turn, precedes its complementary part, the background (see the Hungarian example (6)). If, however, the focus is the first sentential constituent, as, for instance, in German answer focus as in (18b), the Topic First Principle seems to be suspended.

- (18) a. His name I never found out. (Taglicht 1984: 3)  
 b. A: What have you bought?  
 B: *Ein BUCH habe ich gekauft.*  
 a book.ACC have I bought  
 ‘I have bought a book.’

According to Herring (1990) both principles depend on the word order type of the language in question. She argues that “information structure is determined relative to a language’s basic word order, as a rhetorical marking strategy. Verb-subject languages tend to order focus (comment) before topics, in contrast to languages of either the SVO or SOV type” (see also the Italian example (7)).

To conclude, the general and typologically relevant hypothesis of syntax-based approaches is that information structural notions like topic and focus are represented as formal features in the syntactic component of the generative system. Feature-annotated syntactic structures are interpreted on the two interpretive levels, PF and LF, which constitute interfaces with the articulatory-perceptual and the conceptual-intensional systems (Chomsky 1995: 168) as represented by the T-model in (19).

(19) *Model of Grammar*



The claim that information structure is syntactically encoded and feeds into the PF and LF component is often referred to as the *two-interpretive interface hypothesis*.

(20) *Two-Interpretive Interface Hypothesis*

The syntactic structure is interpreted at its interfaces, PF and LF.

The advantage of the two-interpretive interface hypothesis is that it is based on a strictly modular and therefore a restrictive model of grammar. However, the disadvantage of the two-interpretive interface hypothesis is that it has been driven by theory-internal rather than empirical considerations. To put it more bluntly, the claim that phonology interacts with meaning only via syntax and vice versa might be empirically inadequate. It has long been observed (e.g., van Riemsdijk and Williams 1986, Woodbury 1987, Winkler 1997) that information structural phenomena may pose a challenge to this hypothesis since they seem to allow for a direct interaction between the different modules. There is, for example, the phonological or prosody-based account, which proposes that some movement operations are not feature-driven and do not occur in syntax, but are rather phonologically driven and occur in the phonological component (cf. Zubizarreta 1998, Szendrői 2001, 2004, Erteschik-Shir 2006). This view is further developed by Féry, this volume, Abraham, this volume, and Monárfi, this volume. They argue that phonological requirements trigger movement for different information structural effects. What still needs to be investigated are the testing tools for phonological movement and how they are differentiated from syntactic movement. Yet another view suggests that a direct correspondence exists between phonology and interpretation without recourse to syntax as hypothesized by Schwarzschild (1999) and Büring (2006) for givenness-related phenomena from a semantic perspective. Although the exploration of direct interaction between the different components seems to show that there are, in fact, some phenomena which do not require the representation of pragmatic information structural notions in syntax, such as givenness phenomena, including some forms of ellipsis (cf. Winkler 2005, 2006, Gergel, Gengel & Winkler, this volume and Schwabe, this volume), most of the typologically relevant generalizations discussed in this volume, such as focus and topic marking, involve the syntactic component in one way or another.

2.2 *The interpretive approach: The semantics-pragmatics interface*

Information structuring, since Halliday (1967) defined as the linguistic encoding of information which is structured with respect to the communicative relevance of its constituents, poses a challenge for generative theories of grammar and for semantic theories: nowhere is the necessity of a direct interaction of semantic, syntactic, and phonological factors, on the one hand, and of pragmatic interpretation, on the other, more apparent and the precise nature of the interaction more controversial. In this book information structure is regarded as a complex interface between the components of grammar and pragmatics.

The leading idea of the interpretive approaches is the assignment of discourse functions to syntactic and/or phonological constituents. Interpretive approaches are thus concerned with the mapping of the formal linguistic structure onto the semantic structure. They interpret syntactically and phonologically marked focus or topic constituents, modeling their sentence-internal and sentence-external function. If an approach takes the linguistic structure as its starting point, we subsume it under the cover term *semantic-based approaches* – cf. the approaches of Jackendoff (1972), Jacobs (1982, 1983, 1984, 1988), Rooth (1985), Büring (1997) and authors of this volume such as Cohen, Eckardt, von Heusinger, Portner, Reich, Schwabe, and Wedgwood. In contrast to the semantic-based approaches, there are *pragmatic-based approaches*, which take communicative and functional aspects of a sentence as their starting point and model a separate information structural component (cf. Dik 1978 and Vallduví 1992). Within the pragmatically based theories, the elaboration of pragmatically determined information structure is of primary concern. In addition to the grammatically relevant notions topic and focus, several other related concepts have been suggested and different levels of information structure have been developed for the integration of these concepts into the pragmatic system. Especially the relational concepts given versus new and theme versus rheme play a major role in the pragmatic view. These notions are essentially pragmatic in the sense that they track the information status of discourse constituents which are not necessarily derived from purely grammatical properties or features. The pragmatic notions are, for example, relevant for the internal differentiation of focus (cf. Lenertová & Junghanns, Hartmann & Zimmermann, this volume). Since in contrast to the semantic-based approaches, the pragmatic-based approaches are less concerned with the direct relationship between form and interpretation and we are primarily interested in the universal and language-specific forms of information structuring, this volume concentrates mainly on the semantic-based approaches. It refers to the pragmatic-based approaches only in those instances when traditional notions like contrast and focus or the various topic types cannot be supported by linguistic evidence.

There are at least three theoretical variants of the semantic-based approach to information structure: the *semantic-syntax view*, the *semantic-phonology view*, and the *semantic-based view*. The semantic-syntax view has its historical roots in the focus projection concept of Höhle (1982) and Selkirk (1984, 1995). This concept models the distribution of accents by allowing pitch accents to mark more than just the accented constituent as focus. While the principle of focus projection makes use of syntactic concepts – e.g., head, internal argument, and adjunct (Gussenhoven 1983), the actual conditions on accenting relate prosody via syntax to semantics. Many arguments against the strict syntactic approach to focus have been made based on this moderate view (Gussenhoven 1999). In recent years even the role of syntactic focus marking has been debated and the semantic-phonology view has become a research topic. This approach goes back to ideas about the notions of givenness (Halliday 1967) and highlighting (Bolinger 1972). For example, Schwarzschild (1999) proposes a system in which accent placement is directly mediated by interpretive principles, thereby explaining the effects of focus. While Schwarzschild's approach still employs focus marking, Büring (2006) proposes doing away with it completely. Finally, the pure semantic view, which concentrates on the sentence-internal and -external functions of focus and topic constituents, can be subdivided into the *Structured Meaning Approach* (Jacobs 1982, 1983, 1984, von Stechow 1991, Krifka 2006), the *Alternative Semantics Approach* (Rooth 1992), and the *Expressive Semantics Approach* (Potts 2003a, b, and Portner, this volume).

Semantic-based approaches, which regard focus and topic as semantic phenomena, design formal methods to model focus-background and topic-comment structures. In Jacob's *Relational Focus Theory*, each focus constituent is bound by a focus binding element. Focus binders are focus sensitive particles like *only*, *even* and *not* (21a), attitudinal predicates, and illocutionary operators (21b) – cf. Jacobs (1984) and the discussion of his approach in Hetland & Molnár (2001).

- (21) a. ONLY ( $\lambda x^{NP}$  [Peter visits  $x$ 's sister], Gerda)  
 b. ASSERT ( $\lambda x^{NP}$  [Peter visits  $x$ 's sister], Gerda)

Following Jackendoff (1972) and Rooth (1985), Jacobs (1988: 91f.) relates the focus to a “coherent class of possible contrasts with the focus.” In contrast to the syntactic approaches mentioned above, Rooth’s theory manages without focus movement. Focus is licensed by the c-command relation between the focus and the focus sensitive particle. According to Rooth’s (1992) *Theory of Focus Interpretation*, focus is realized by that accent which goes to the most accentable syllable of the focus constituent, or in other words, to the focus exponent. The focus exponent is a syntactic  $X^0$ -category associated via focus projection with a focus feature. This focus feature is assigned freely to a syntactic constituent and thus forms a focus domain. While in the case of narrow focus the focus exponent and the focus domain coincide, where the focus is wide the focus feature projects to the focus exponent. As for the focus semantics, it is a matter of a separate semantic dimension – i.e., Rooth distinguishes between the ordinary meaning and the focus meaning. The focus meaning results from the interpretation of the f-feature. According to Rooth’s theory, each focus feature is interpreted at LF by a focus operator written  $\sim$ . For example, the interpretation in (22) takes place at the level of the FocP-node, which is adjoined to the FocP, which hosts the focused constituent. To show how Rooth’s theory works, we examine the answer (22B) to the question (22A):

- (22) A: Who has written a letter to his mother?  
 B: HANS has written a letter to his mother.  
 [<sub>CP</sub>[<sub>FocP</sub>[<sub>FocP</sub> HANS has written a letter to his mother]  $\sim$  C]]

The focus operator  $\sim$  has two arguments: one argument is the expressed proposition ‘Hans has written a letter to his mother’ ( $= p$ ), the other one is the set of alternatives  $C$ . The semantics of the focus operator introduces two conditions. The first one demands that  $p$  and  $C$  must belong to the same *focus semantic value* ( $[[\alpha]]^f$ ). The focus semantic value of a sentence is defined by Rooth as a set of propositions which is, informally speaking, derived from the semantic value of the sentence in such a way that the position of the sentence occupied by a focused constituent is substituted by a variable. For  $p$  in (22B) the focus semantic value is therefore:

- (23) { **write a letter**  $x$ ,  $x$ 's mother /  $x \in E$  } , with  $E$  as individual domain

To prevent variables from being instantiated identically in both conjuncts, the focus operator introduces a second condition. This condition demands that the ordinary meaning of  $p$  ( $[[\alpha]]^0$ ) is not a subset of  $C$ . Büring (1997) expands Rooth’s theory in that he adds the topic meaning to the focus meaning dimension. Similarly to the focus semantic value, which he calls focus value, he postulates a topic value for prosodically marked topics which provides the relevant set of alternatives.

Potts (2003a, b) expands the two-dimensional semantics by adding the interpretation of appositives, honorifics, and epithets, as well as conventional implicatures, to the interpretation of topic and focus. To distinguish all these meanings from the ordinary or at-issue meaning, he calls them expressive meanings. According to Potts, the final meaning of a sentence has two dimensions and can be represented as a pair  $\langle A, C \rangle$ , where  $A$  is the ordinary, at-issue meaning and  $C$  is the set of expressive meanings (cf. Portner, this volume). Whereas Potts manages the parallel calculation of the ordinary meaning and expressive meaning via type theory, Portner (this volume) explicitly calculates the two meanings using separate interpretational functions. He adds to the expressive meaning set the vocative, topic and force meaning.

The semantic approaches in this volume regard LF as a syntactic structure which is related to the syntactic Spell-out structure, on the one hand, and to semantic structures – ordinary sentence meaning, illocutionary force meaning, focus meaning, and topic meaning –, on the other. The format of the semantic structures is provided by different inputs: the ordinary meaning is structured by the ordinary semantic information of lexical categories, the force meaning is structured by a, let's say, illocutionary operator and the sentence form, the focus meaning is structured by the focus and background constituents, and the topic meaning is structured by the topic and comment constituents. The question of whether LF is also related to PF is still an open issue (cf. Féry, this volume).

As observed by Jacobs (1997), focus and topic meaning can influence the ordinary meaning– cf. the scope of negation in (24), which depends on the accent type of the quantifier phrase. The slash signals a rise and the  $\surd$  a fall-rise.

- (24) A. *Kann man denn alle Romane von Grass empfehlen?*  
 can one PART all novels by Grass recommend  
 'Can one really recommend all novels by Grass?'  
 B. *Alle Romane/die kann man NICHT empfehlen.*  
 all novels/they.ACC can one not recommend  
 'One cannot recommend them.'  
 B':  $\surd$ *Alle Romane kann man nicht empfehlen*  
 'One cannot recommend all oft hem.'

The influence of focus and topic interpretation on the ordinary meaning is also shown by Cohen and von Heusinger, this volume.

Several papers in this volume discuss the issue of whether all syntactically or prosodically focus-marked constituents only indicate discourse non-given information. Therefore, one might assume that focus can be underdetermined with respect to its interpretation as being something additional to discourse non-givenness (cf. Lenertová & Junghanns and Hartmann & Zimmermann, this volume). Similarly, Wedgwood (this volume) argues that the interpretation of the prefinite verb position in Hungarian, which is commonly considered to function as an identificational focus position, is semantically under-determined with respect to its information structural function. As the examples in (25) show, the position just before the finite verb can have an identificational focus interpretation (a), a presentational focus interpretation (b), and non-focus interpretations (c and d). The actual information structural interpretation of this position, Wedgwood claims, must be inferred pragmatically.

- (25) a. *János MARIT hívta meg.*  
 János Mari.ACC invited VM  
 'It's Mari who János invited.'  
 b. A: *Kit hívtak meg?*  
 who invited.3PL VM  
 'Who did they invite?'  
 B: *János (hívták meg).*  
 János.ACC invited.3PL VM  
 '(They invited) János.'  
 c. *János meg hívta Marit.*  
 János VM invited Mari.ACC  
 'János invited Mari.'  
 d. *János látni fogja Marit.*  
 János see.INF will Mari.ACC  
 'János will see Mari.'

The concept of semantic underdeterminateness also plays a role with respect to the force interpretation of independently used German complement clauses. Schwabe (this volume) shows that these sentences have a syntactically silent matrix predicate, the expressive meaning of which is inferred pragmatically.

### 2.3 *Longstanding questions and new contributions*

The major task of future information structure research is to spell out how the core grammatical components interact with the pragmatic component, and conversely, how the discourse component is internally structured. One fundamental issue is how this structure is mapped onto grammatical structure. More precisely, we must specify which notions and layers must be established and how their relations can be described. There are four burning issues to which the volume contributes:

1. The definition of information structure: The term information structure is often used as a cover term for various discourse notions which are integrated as features in syntax and then mapped onto semantics and phonology. However, information structure in Halliday's original work (1967: 200) refers to the hypothesis that "the distribution of information specifies a distinct constituent structure on a different plane; this 'information structure' is then mapped onto the constituent structure as specified in terms of sentences, clauses and so forth (...)." The central questions are the following: What is the structured object at issue? Is it the content of the information, thus a proposition? Is it the form of the information, the syntax and prosody of a sentence? If it is the form, what does it really express with respect to information packaging? Many different research programs have since explored aspects of information structure. The idea that it constitutes an autonomous component by itself, i.e., with its own inventory of categories (topic, (comment,) focus, (background,)) which form structures according to IS-specific rules and which are mapped onto the syntactic and phonological structure, has been proposed by Vallduví (1992). Assuming a similar approach, Portner (this volume) proposes an expressive meaning account in which the topic-comment structure and the focus-background structure are considered to be autonomous meaning structures with respect to the ordinary meaning. They have the same independent status as the illocutionary sentence type meaning.

In the present volume, we concentrate on the interrelatedness between the syntactic structure of a sentence, its derivational history (including movement and anaphoric processes) and its information structural interpretation. Thus, the investigation of information structure is a program to clarify the interface between structure, sound, meaning and context. More precisely, we use the term information structure to refer to focus- and topic-annotated properties of the syntactic and prosodic structure and its respective interpretations. When we are referring to the semantic information structure, we use the term *Surface Semantic Interpretation* (SSI), a term introduced by Chomsky (2000, 2001: 15) to describe the interface between syntax and the conceptual component that is responsible for the interpretation of syntactic displacement. When we refer to the pragmatics of information structure, we acknowledge that word order variation and speech act types are determined by context and discourse factors. Pragmatically determined information structure is to be seen as a specification of the grammatically determined surface semantic effects.

2. The architecture of grammar: How does syntax interact with its interpretive components (PF, LF) in information structural accounts in different languages? Most papers in this volume written in the generative framework adopt the Minimalist Program (Chomsky 1995) and the two-interpretive interface hypothesis in (20), which states that the syntactic structure is interpreted at its interfaces (cf. Drubig, Frascarelli & Hinterhölzl, Surányi, Gergel, Gengel & Winkler, Göbbel, Lenertová & Junghanns, all in this volume). The book also reflects recent work on IS and accent placement, such as Schwarzschild (1999) and Büring (2006), who challenge this hypothesis and address the issue that the grammatical components allow for a richer flow of information between them. More precisely, Féry, Abraham, and Molnárfi propose that phonological requirements trigger movement. Féry, for example,

argues that topicalization is triggered in order to avoid a stress clash between two constituents, while Abraham and Molnárfi assume that scrambling is a phonologically driven movement operation. The volume also presents some innovative work on the interaction between syntax and semantics. More specifically, Wedgwood challenges the traditional view incorporated in the two-interpretive interface hypothesis that there is a one-to-one mapping of syntactic structures to semantic forms. He investigates the preverbal focus position in Hungarian and hypothesizes that this position is underspecified in the sense that extragrammatical inferential processes determine the exact interpretation of the elements located in this position. Moving even further away from the two-interpretive interface hypothesis, Portner argues that certain structural phenomena, such as vocatives, topic and force introduce separate performative or expressive meanings in addition to the main utterance content which are best analyzed by a theory of expressive meaning, as proposed by Potts (2003a, b).

Some questions with respect to the two-interpretive interface hypothesis still remain unsettled. The most pressing question is whether the syntactic account, the phonology-based account and the interpretive account make different predictions. With respect to the phonological account, the question of whether the assumption of phonological or stylistic movements at PF causes a weakening or strengthening of the generative paradigm is still open. Since neither of these theories can be favored over the others on conceptual grounds, the investigation of the phonology, syntax and semantics of information structure is essential for the clarification of this issue on empirical grounds. Therefore, the main goal of this volume is to systematically gather and analyze phonological, syntactic and interpretive data and thereby contribute to current information structure research within generative grammar.

3. The interaction of grammar and pragmatics: Is there a more complex pragmatic correlation to the grammatical information structure, a structure one could call *pragmatic information structure*? What feeds this pragmatic information structure? Is it only the SSI as a structural layer belonging to the grammar? Or are there rules operating at the interface between grammatical information structure and pragmatic information structure which have direct access to syntax and prosody? The present volume offers some pieces of evidence which argue for SSI: the semantically underdetermined matrix clause of *solitaires* in Schwabe, prosodically marked, but semantically underdetermined left-peripheral constituents in Hausa in Hartmann & Zimmermann, and the so-called preverbal focus position in Hungarian, which, according to Wedgwood, is underdetermined with respect to a focus interpretation. Thus, the basic question is: How much of the pragmatic information structure is grammatically encoded? As for, for instance, the notion of focus, one could rely on Sperber & Wilson's (1986) relevance theory and regard focus stressed constituents as merely expressing relevant or salient discourse entities. Whether they are discourse new or given and contrasted is decided by the pragmatic context. Something similar could hold for the various topic types as proposed in Frascarelli & Hinterhölzl (this volume) if the particular accents they discuss are motivated prosody-internally. The answer to the question as to whether topics and focuses are anchored in semantics or pragmatics has consequences for the localization of the discussion concerning issues so far regarded to be proper semantic issues. Particular issues addressed in this volume, such as the kind-interpretation of English bare plurals, which depends on their topichood (Cohen), the non-unique interpretation of the definite article in complex DPs containing narrow focus (von Stechow), and the interpretation of syntactically silent constituents in gapping constructions (Reich) and *solitaires* (Schwabe), then turn out to be proper interface phenomena. One could regard information structure as the syntactic grammaticalization of pragmatic backgrounding and foregrounding which is motivated by discourse relevance or irrelevance. Discourse relevance or irrelevance can also be grammaticalized lexically. This is shown in Eckardt in this volume.

4. Typologically relevant information structural generalizations: In the search for language-specific manifestations of universal principles, recent research has located constraints which restrict the possible mappings between syntax, semantics, phonology and pragmatic relations. Let us concentrate on three typologically relevant generalizations which, we assume, are relevant for the two-interpretive interface hypothesis:

### *i. Isomorphism hypothesis*

The research of the last two decades has identified the left periphery as the main area to which topic and focus constituents are moved for interpretational purposes. Evidence from different types of constructions has been discussed in recent years which suggests that an IP-internal focus position is also available in English. Kayne (1998) proposes that putative *in situ* negative and focus operators move to a position in the lower IP area. Expanding the initial evidence given in Fox (2000) and Chomsky (1999, 2005) that *wh*-phrases adjoin to vP on their way to CP, Johnson (2003), López & Winkler (2003) and Winkler (2005, 2006) argue that the contrastive remnants in gapping constructions move to the edge of the verbal phrase. Göbbel (this volume) proposes that focused manner adverbs move to a structural focus position at the edge of vP with subsequent remnant movement of the defocused VP. By relating these observations to the concept of phases (Chomsky 1995, 2005), Drubig (this volume) arrives at a typologically relevant generalization: the *isomorphism hypothesis*. This hypothesis states that derivational phases have parallel structures and that therefore information structure positions must be represented not only at the left periphery of the overall clause, but also in the lower vP area. Drawing on language-particular and typological evidence from topicalization, clefts, polarity, modality, interrogative force and ellipsis, Drubig argues that the isomorphism hypothesis derives the typologically attested word order variations in the representation of information structure across languages. The isomorphism hypothesis might have further implications, both empirically and theoretically. For example, crosscategorical symmetries seem to suggest that the isomorphism of functional peripheries may not be limited to clauses, but may extend to other categories, such as DP. From a conceptual perspective, it would be highly desirable if the isomorphism hypothesis could be shown to apply in general to all functional edge positions.

### *ii. Focus and topic marking hypothesis*

Topic and focus interpretations across languages are signaled by different grammatical devices: *syntactic movement*, as proposed by Drubig, Gergel, Gengel & Winkler, Göbbel, Law; *prosodic highlighting, deaccentuation, or deletion*, as proposed by Abraham, Féry, Frascarelli & Hinterhölzl, Gergel, Gengel & Winkler, Molnárfi, lexical means as is shown in Hetland, *syntactic indeterminateness*, as in Schwabe; and *morphological markers*, as proposed by Hetland, Hartmann & Zimmermann, and Zerbán (all this volume).

### *iii. Multiple question-answer congruence hypothesis*

Recent research has concentrated on multiple *wh*-questions and their corresponding answers. Two crosslinguistically relevant generalizations with respect to the focus structure are presented in this volume: Surányi's *Pair List Generalization* and Reich's *Uniform Condition on Short Answers and Gapping*. Concentrating on the focus structure of multiple questions in Hungarian, Serbo-Croatian and Japanese, Surányi shows that the generalization that *wh*-movement and focus movement target the same left-peripheral position (cf. Brody 1990 and Rizzi 1997) is only true for single *wh*-movement. In multiple *wh*-interrogatives, the central observation is that, again, only one *wh*-element must be focused. Based on empirical evidence, Surányi formulates the pair list generalization, which states that a pair-list interpretation is generated at the interface only in the presence of multiple *wh*-elements in a single functional focus projection, where the focus bears the *wh*-feature. A different, but related generalization type is presented by Reich (this volume). Concentrating on short answers and gapping in response to multiple *wh*-questions, Reich puts forth the uniform condition on short answers and gapping. The condition specifies that short answers and gapping are subject to similar conditions: the deleted material is given in the context as a salient "question under discussion." In the case of short answers the material is explicitly given by the question, while in the case of gapping the relevant question under discussion is

reconstructed on the basis of the focus-background structure of the initial conjunct. Both papers highlight different information structurally relevant aspects of multiple questions and their related answers.

#### *iv. Focus underspecification hypothesis*

Particular topic and focus interpretations across languages are determined by non-grammatical, i.e., pragmatic triggers, such as *emphasis* (cf. Lenertová & Junghanns and Hartmann & Zimmermann, this volume) and *avoidance of incompatibilities*, such as stress clash in Féry (this volume), antifocus in Molnarfi (this volume), and the requirement ‘avoid default interpretation’ in Zerbian (this volume).

The research strategy has been straightforward for many years: linguists have investigated word-order variation, and phonologically and morphologically marked topic or focus constituents and derived the relevant interpretations in different theoretical frameworks. However, the common vision has been to achieve a more precise understanding of the rules that determine information structure. Therefore, the hypotheses in i. to iv. are interrelated. In i. the signaling device for particular information structural interpretations is clearly grammatical and therefore identifiable within the existing models of generative grammar. In iv. researchers are searching for possible triggers of information structural interpretations outside grammar. The major task of future information structure research is to extend the empirical domain and the empirical expertise, particularly to remote languages, in order to identify the grammatical features which lead to specific information structural interpretations.

### **3 The Chapters**

This volume documents the achievements of linguistic investigation in information structure. Information structure is understood as the interface between syntactic and semantic form, syntactic and phonological form, and, depending on the theoretical approach, between semantic and phonological form. The aim of this book is to contribute to a better understanding of these interfaces and to spell out the rules and conditions that define this complex interaction. To give an example: Ideally, the information structure of a preposing construction, such as (18a) above, receives syntactic, phonological, semantic and pragmatic analyses which capitalize on each other’s insights. The resulting constraints must be understood as interface conditions on the information structure of topicalizations. The research program resulting from this vision is to find relevant rules and generalizations that operate on the information structure interface. In particular, the fruitful discussion and interaction between the formal and interpretive approaches have illuminated many formal and functional aspects and revealed many typological regularities. The overall research goal with respect to topic and focus is to provide a detailed account of the theoretical status of these notions and their respective representation in the different parts of the language system. The papers introduced in this section are arranged accordingly. The major theoretical challenge is to spell out the interaction between the three main components of the grammatical model: the syntactic component, phonological form and logical form. Since none of the abovementioned theories can be favored over the others on conceptual grounds, the investigation of the syntax, phonology and semantics is essential for the clarification of this issue on empirical grounds. Therefore, the main goal is to systematically gather and analyze the syntactic-, prosodic- and meaning-related data, and thereby contribute to current information structure research within generative grammar.

### 3.1 *Information structure and grammar: Generalizations across languages*

Hans Bernhard Drubig: *Phases and the typology of focus constructions*

Covering a wide variety of special topic- and focus-related constructions with different information structural interpretations, Drubig's paper presents significant generalizations for a universal theory of information structure. The central hypothesis is that most of the variations attested in the typology of information structure can be accounted for utilizing a generalized phase-based approach. There are three essential characteristics of this approach: (i) The clause consists of two predicative layers (VP and TP) forming an eventive and a propositional phase, with their respective functional peripheries, the lower CP, dominating vP, and the higher CP, at the left edge of the overall clause. (ii) Both phases are isomorphic and have identical structural peripheries. (iii) The phases are built up cyclically and once closed they are sent to the interpretive component. There the peripheries are subject to different domain-specific semantic interpretations, event-related in the lower phase and proposition-related in the higher. Evidence for this theory is provided on the basis of facts from topicalization, clefts, polarity, modality, interrogative force, and ellipsis in many different languages. The ultimate goal is the derivation of an explanatory account of information structure within which certain factors contributing to crosslinguistic generalizations can be accommodated.

#### 3.1.1 *Topics and topicalization across languages*

Caroline Féry: *The prosody of topicalization*

Couched within an Optimality Theory framework, the paper by Féry convincingly shows that certain types of displacements, particularly those of contrastive and split topics in German, may be driven by phonological requirements. The basic idea is that displacement to the German *Vorfeld* is motivated by the need to avoid a clash between two pitch accents associated with constituents that bear different discourse functions. The paper also contains an interesting discussion and analysis ofthetic sentences with marked word order. Situated at the syntax-phonology interface, the paper can be classified as being part of the small, but growing literature on phonologically driven movement operations, which have been pursued for other languages as well (see, for example, Szendrői 2004 on Hungarian; Zubizarreta 1998, Göbbel, this volume, and Frascarelli & Hinterhölzl, this volume, on Romance; Erteschik-Shir 2005 on Icelandic).

Mara Frascarelli and Roland Hinterhölzl: *Types of topics in German and Italian*

In contrast to Rizzi's (1997) free recursion analysis, this paper argues that topics are not freely recursive. Taking as a starting point a detailed intonational and syntactic analysis of Italian and German corpus data, the paper shows that three types of topics are distinguishable based on their syntactic and prosodic properties: shifting topics (= new aboutness topics), contrastive topics, and familiar topics (continuing or non-new aboutness topics), and that these three topic types correspond to different discourse functions. The main hypothesis of this paper is that the topics are ordered strictly hierarchically in the C-domain such that shifting topics dominate contrastive topics, which in turn dominate familiar topics. The results of extensive phonological investigation show that Italian and German distinguish the same types of topics. However, since the grammars of both languages are organized differently, they differ considerably in the syntactic realization of these topics. German uses Case to identify the grammatical function of topics and resorts to scrambling. Italian uses clitics in left-hand and right-hand topic constructions to mark the syntactic function of the dislocated element. And since clitics are related with *pros* in an A-position and pronouns cannot be locally A-bound, Italian topics are merged in an A'-position.

Jorunn Hetland: *The Korean particle nun, the English fall-rise accent, andthetic/categorical judgements*

Hetland's paper examines the information structure of accented *nun*-phrases in Korean and compares it to the effects of using the fall-rise pitch accent in English. The central hypothesis is that accented *nun*-phrases do *not* have a uniform interpretation at the topic-comment level of Korean sentences. Depending on their surroundings in the sentences where they appear, accented *nun*-phrases may play one of the following roles in information structure: they may act as topics, as part of the comment, or even as the *core* of the comment in categorical as well as inthetic sentences. A similar ambiguity applies to the fall-rise accent of English sentences. The paper's claim is that a speaker who uses an accented *nun*-phrase in Korean or a fall-rise accent in English conveys that the addressee will find some relevant alternative to the marked constituent within his knowledge store. The crosslinguistic generalization is that both languages provide a tool for signaling this function independently of the topic-comment distinction in both languages.

Paul Law: *Topicalization in Malagasy, Tagalog and Tsou*

This paper provides an interesting insight into topic constructions of the Austronesian languages Malagasy, Tagalog, and Tsou. It shows that despite the typological distance of these languages from the other languages discussed in this volume, they also mark topical elements in the left periphery. The paper argues that there are two different syntactic structures underlying topicalization in Tsou and Tagalog, but only one for topicalization in Malagasy. Similarly to German, Italian, English (see Frascarelli & Hinterhölzl, this volume, and Frey (2004 a, b) and many other languages, topical elements in Tsou and Tagalog can either be moved from an argument position, just like *wh*-elements and relative pronouns, or can be base-generated as an adjunct to a sentence containing a coreferring null pronominal element *pro*. Malagasy, in contrast, which does not provide such a coreferring *pro*, does not have base-generated topics. All three languages are very closely related in that their verbal morphology determines which argument is a trigger, i.e., can be moved into a topic or *wh*-position. Law shows that only phrases marked as triggers can be extracted. If topical elements in Tsou or Tagalog are not marked as triggers and are base-generated in a topic position, they must be related to a *pro*. The silent pronoun, which also can occur for independent reasons, is licensed by agreement in Tsou and by contextual recoverability (indeterminateness) in Tagalog. The paper further argues that Malagasy has a TopPhrase because of its topic marker *dia*; the topics in Tsou and Tagalog, however, are adjoined to IP.

Laszlo Molnárfi: *On the discourse configurationality of West Germanic*

The paper by Molnárfi discusses the focus properties of different West Germanic languages, in particular German and Afrikaans, and contrasts the results with focus prominent languages, such as Hungarian. The main claim is that word order variation in West Germanic is driven by a prosodic interface condition, which ensures that deaccented constituents are moved to designated positions in the middle field. Thus, definite categories must leave the domain of predication, while indefinites remain there and may function as focus exponents. More precisely, it is argued that a prosodic feature is responsible for the deaccentuation of referential definites, referred to as antifocus. In contrast to syntactically driven movement, the displacement triggered by antifocus remains fundamentally optional. The observed optionality of this prosody-driven movement is explained by the optional pronunciation of the base position of movement chains.

Werner Abraham: *Topic, focus and default vs. contrastive accent: typological differences with respect to discourse prominence*

Abraham's paper discusses different approaches to the integration of the discourse functions theme and rheme into the grammar, concentrating on the basic characteristics of discourse prominence in West Germanic, most prominently German and English. The central claim is that discourse functions in German can be computed on the basis of the architecture of German clause structure and the distribution of clausal accent. In contrast to other approaches which enrich the clause structure with functional projections to host topic and focus constituents (Frey 2006, Molnárfi, this volume, Grewendorf 2004, Breul, this volume), this paper assumes a lean clause structure from which the information structural interpretations can be read off in the interpretive components. The paper discusses aspects of specificity and adverb placement (cf. also Göbbel, this volume) and proposes that word order variation is driven by prosodic requirements. It shows how the proposal that German signals discourse prominence while English signals grammar prominence is implemented in the grammar of clause structure.

### 3.1.2 *Focus and focus movement across languages*

Dan Wedgwood: *Identifying inferences in focus*

This paper takes a fresh look at the syntax-semantics interface, and proposes a new approach to the generally held assumption of a one-to-one mapping of syntactic structures to semantic forms. The main claim is that once the effects of extragrammatical inferential processes are taken into account, the relationship between linguistic structure and its interpretation is more complex. Concentrating on the focus position (FP) in Hungarian, the author arrives at an overarching generalization identifying the apparent preverbal focus position as one manifestation of a more general word order/meaning correspondence, which also accounts for the position of verbal modifiers and verbs in so-called neutral sentences. The meaning encoded in the relevant grammatical configuration is a certain kind of predicative procedure (cf. É. Kiss 2006). The identificational and exhaustive interpretations of certain expressions in this position predictably follow by inference on the basis of this procedure and therefore need not be attributed to grammatically encoded semantic operators. On the basis of an in-depth comparison of the Hungarian FP and English *it*-cleft constructions, it is shown that the *it*-cleft encodes an identificational reading, while the Hungarian FP gives rise to an identificational reading following from the newly identified predicative procedure.

Balázs Surányi: *Focus structure and the interpretation of multiple questions*

Surányi's paper explores the idea that multiple movements of *wh*-elements are a necessary and sufficient condition for pair list readings. On the basis of intensive language-specific and crosslinguistic evidence, Surányi sharpens the pair list generalization, which states that a pair list interpretation is generated at the interface only in the presence of multiple *wh*-elements in a single functional focus projection, where the focus bears the *wh*-feature. He shows that this generalization not only applies to English, as has been previously suggested, but also extends to Hungarian, Serbo-Croatian and Japanese. He investigates the focus structure of multiple questions in these languages and finds that the generalization that *wh*-movement and focus movement target the same left-peripheral position is only true for single *wh*-movement. In multiple *wh*-interrogatives at least one *wh*-element needs to be focused, but the other *wh*-elements need not be. These findings contribute substantially to our understanding of the division of syntactic labor between the *wh*-feature and the focus feature with respect to the deeper regularities concerning their interpretation in pair-list contexts.

Carsten Breul: *Focus structure, movement to spec-Foc and syntactic processing*

This paper discusses the stylistic construction generally known as fronting, preposing or topicalization in English and German on the basis of a recently developed feature-based theory of focus structure (cf. Breul 2004). The central hypothesis of this theory is that there are three different types of focus structures, which differ with respect to their syntax: the categorical and identificational root clauses are characterized by the presence of FocP, while thethetic sentences lack a FocP. This FocP-hypothesis proposes that the derivation of the categorical and identificational sentences is triggered by [ $\pm$ foc] features on the topic or focus constituent, whilethetic sentences do not involve movement. In conjunction with a processing account, this theory can explain the core differences in the acceptability of German and English preposing structures.

Edward Göbbel: *Focus and marked positions for VP adverbs*

Couched in current minimalist syntax, this paper discusses evidence for a complex middle field in English using a phase-based approach. It investigates the distribution of English manner adverbs in different focus contexts. Assuming that broad focus utterances are a reliable test for information structurally unmarked positions of adjuncts, this paper argues that the transportability of adverbs within certain clausal spaces can be captured by allowing different functional heads to license appropriate classes of adverbs within their c-command domain. The highest position of a particular adverb is the specifier of the licensing head; lower positions are traditional adjunction positions. Marked positions of adverbs in the lower portion of the clause are the result of movement of the adverb to a structural focus phrase in the lower IP-area. Movement to the right, as with certain heavy adverbs, is analyzed as phonologically driven movement at PF, lacking a syntactic trigger.

Remus Gergel, Kirsten Gengel and Susanne Winkler: *Ellipsis and inversion: a synchronic and diachronic perspective*

The goal of this paper is to provide an account of the syntactic and prosodic licensing conditions on VP-ellipsis under inversion with respect to the isolation of contrastive topics and foci in English and the parallelism constraint. Recent studies (e.g., Lasnik 1999, Merchant 2003) have proposed PF-repair strategies according to which VP-ellipsis takes place to repair an otherwise illicit configuration. Concentrating on one particular instance of VP-ellipsis, occurring in comparative constructions both with and without inversion, the authors argue that a purely syntactic repair strategy approach is in need of qualification. They propose an information structural approach and claim that the necessity of VP-ellipsis in comparative constructions under inversion is directly related to a more general parallelism condition (cf. Fox 1999, Lang 2004) and to a syntax-based concept of focus isolation. The evidence provided draws on synchronic and diachronic sources and on prosodic and syntactic investigations of the remaining elements after ellipsis.

Sabine Zerbian: *The subject/object asymmetry in Northern Sotho*

This paper discusses a subject/object asymmetry with respect to focus in Northern Sotho, a Bantu language spoken in South Africa. As in Hausa (cf. Hartmann & Zimmermann, this volume), objects in Northern Sotho can be focused in their canonical position, whereas subjects cannot. The subjects are either located in a cleft construction or postverbally. The article presents the relevant data for subject focus in cleft constructions and proposes an analysis within the Optimality Theory framework. According to this analysis, *in situ* subject focus and *in situ* subject *wh*-phrases are excluded by the dominance relations between certain constraints: *Subject=topic*, which prevents a focused subject from remaining in SpecI, which is also a topic position, is ranked over *Subject*, which demands that there must be a subject in SpecI to check agreement features between the subject and the finite verb. *Subject* dominates *Stay*, which prevents focused objects and subjects of intransitive verbs from focus move-

ment. And *Stay* is ranked over *Foc-Spec*, which requires focused constituents to be in an operator position, which is a cleft position in Northern Sotho.

Denisa Lenertová and Uwe Junghanns: *Wide focus interpretation with fronted focus exponents in Czech*

This paper also investigates a left-peripheral focus phenomenon: the distribution and information structural interpretation of fronted focus exponents in Czech. While it is generally agreed that the exponent of neutral focus canonically appears at the right periphery of the clause, the authors observe that there is a systematic pattern of sentence-initial focus exponents in Czech which can be used in the same wide focus inducing contexts. The basic claim is that Czech allows the wide focus exponent to move from its base position at the right periphery of the sentence to the sentence-initial position allowing for a wide focus interpretation, as is the case for focus exponents inthetic clauses. The trigger for the movement of the focus exponent is identified as an emphasis operator. A similar explanation with respect to partial focus movement is presented by Hartmann & Zimmermann in this volume.

Katharina Hartmann and Malte Zimmermann: *In place – out of place? Focus in Hausa*

The authors provide a detailed presentation of syntactic, morphological and prosodic focus marking strategies in Hausa. They show that Hausa provides syntactic conditions for focus movement (*ex situ* focus) and non-moved focus (*in situ* focus) – cf. the observations for Czech and Northern Sotho in Lenertová & Junghanns and Zerbian in this volume. Like Zerbian for Northern Sotho, the authors demonstrate for Hausa that subjects must be focus moved if they have a semantic focus interpretation. Claiming that Hausa has partial focus movement, they present, like Lenertová & Junghanns, an account that takes an emphasis interpretation for the focus moved constituent into consideration. A central claim of Hartmann & Zimmermann's paper is that *in situ* constituents which can have a pragmatic focus interpretation need not be focus-marked, i.e., they can be underspecified syntactically, morphologically, and – what is surprising – prosodically. The paper thus challenges the widely adopted assumption that focus marking is obligatory. It proposes that focus marking appears to be obligatory in accent languages, but not in tone languages. The paper further challenges the hypothesis that different syntactic focus positions are always linked to different semantic interpretations by demonstrating that none of the different focus positions in Hausa has a differentiated focus interpretation. This observation is very close to Wedgwood's claim in this volume that there is a special position in Hungarian for identificational focus.

### 3.2 *Information structure and pragmatics: Clause structure and context*

Paul Portner: *Instructions for interpretation as separate performatives*

The author takes Pott's (2004) expressive meaning theory as a starting point, which regards the meaning of a sentence to be a pair  $\langle A, C \rangle$ , where  $A$  is the ordinary meaning and  $C$  is the set of expressive meanings. Expressive meanings are performatives and thus always true once understood. What is novel in Portner's paper is first, that he integrates vocatives, topics, and declarative, interrogative and imperative forces into the expressive meaning  $C$ , second, that he calculates the two meanings,  $A$  and  $C$ , explicitly using separate interpretation functions, third, that he demonstrates that unlike the ordinary meaning  $A$ , the expressive meaning  $C$  does not have complex compositionality, and fourth, that he shows how topics, as expressive expressions, are interpreted in embedded clauses.

Kerstin Schwabe: *Interrogative complement clauses*

The central claim of this paper is that the illocutionary question meaning of independently used interrogative clauses is not expressed syntactically, but inferred pragmatically. This inference can be supported by particles and/or intonation, which indicate a certain kind of expressive meaning by them-

selves. The paper shows that root and solitaire interrogatives have semantically in common that they are questions, i.e., interrogative functions. Whereas a root interrogative is the argument of the expressive interrogative illocutionary operator INT, which maps the question onto a complex of illocutionary conditions involving addressee-relatedness, an interrogative solitaire is an argument of a matrix predicate variable. The variable is specified pragmatically either by the ordinary meaning of a preceding question – cf. Reich’s (this volume) salient *question under discussion* – or, if there is no linguistic context, by a pragmatic predicate which does not involve addressee-relatedness, but which determines that the interrogative solitaire is either a deliberate question or an exclamative.

Regine Eckardt: *The syntax and pragmatics of embedded yes/no questions*

This paper discusses a further aspect of expressive meaning. It presents an interesting analysis of the different distribution of English *if* and *whether* as complementizers for polar questions in extensional contexts and, specifically, of the restriction of *if*-questions to negative contexts. Eckardt argues that the markedness of embedded *if*-questions in certain contexts emerges through the cooperation of several factors: the question ‘*if S*’ presupposes an (ir-)relevance asymmetry between the proposition denoted by *S* and its negation. This relevance asymmetry leads to a competition between embedded *if*-questions and *that*-clauses in the relevant constellations. This in turn excludes the *if*-question as the less optimal variant.

Ingo Reich: *Toward an uniform analysis of short answers and gapping*

Reich’s paper presents a uniform analysis of short answers and gapping by assuming that both kinds of constructions use the same mechanism: the deleted material is given in the context as a salient *question under discussion*. In the case of short answers the material is explicitly given by the question (cf. Schwabe, this volume), while in the case of gapping the relevant question under discussion is reconstructed on the basis of the focus-background structure of the initial conjunct (cf. Schwabe 2000). The uniform analysis of short answers and gapping is supported by their parallel behavior with respect to the finite first constraint, the major constituent constraint, locality, and island-sensitivity, and furthermore, by the observation that strict/sloppy-ambiguities in gapped sentences are disambiguated when interpreted against the background of multiple *wh*-questions. Providing two variants of this analysis, one couched within Rooth’s (1992) alternative semantics account, the other formulated within Schwarzschild’s (1999) theory of F-marking, the paper compares the two implementations and points out the interesting implications of discourse structuring by implicit questions under discussion. Thus, this paper assumes, like the von Heusinger paper, an expressive meaning approach.

Klaus von Heusinger: *Alternative semantics for definite NPs*

Von Heusinger’s paper discusses the semantics of association with focus in complex definite NPs within the Alternative Semantics framework. It focuses on three main issues: i. the domain of quantification for the focus-sensitive operator, ii. the whereabouts of the uniqueness condition in the set of alternatives, and iii. the alternative function of the definite article. Von Heusinger argues against a simple LF-movement approach since it predicts too many or too few alternatives in the domain of quantification. He extends the Alternative Semantics account in order to analyze complex definite NPs with focused subconstituents, first by formulating the rules for deriving the alternatives for common nouns and their restrictive modifiers such as adjectives and relative clauses, second by giving the alternative composition rules, and third by reconstructing and formally describing the alternative semantic function of the definite article. Discussing the general problem which is caused by the particular alternative function of the definite article, which cannot be derived from its ordinary meaning, von Heusinger suggests the following: The ALT-function is modified so that it generates very fine-grained alternatives. A general maximality condition is substituted for the uniqueness condition of the definite article. The definite article is represented by a choice function and the ordinary and alternative function of the article are

merged into one polymorph choice function. Finally, the construction of alternative sets of definite NPs is analyzed as the alternative function of the type shift operation from a common noun to an NP.

Ariel Cohen: *Bare Plurals as Topics in English and Italian*

Whereas von Stechow shows the dependence of the interpretation of linguistic items on information structure, Cohen's paper demonstrates the dependence of information structural properties on the interpretation of linguistic items. He shows that English and Italian bare plurals which have an existential interpretation and therefore denote properties cannot be topics since they are not specific. If they do not have an existential interpretation and denote a kind, they are topics since they have a specific interpretation, as is the case with bare plurals in English generic sentences. Italian bare plurals, however, cannot denote kinds, but they too can occur in generic sentences. Cohen demonstrates that if they occur in generic sentences, they do not denote a kind, but are, like English indefinite singulars, part of the predication of a specific rule, which is given implicitly. It is this rule which is the topic of the sentence and not the Italian bare plural or English indefinite singular.

#### **4 Conclusion**

*Information Structure, Meaning and Form: Generalizations across Languages* is a collection of articles which offers a new and compelling perspective on the interface which connects syntax, phonology, semantics and pragmatics. The papers in this volume contribute to the enterprise of finding typologically relevant information structural generalizations, such as the isomorphism hypothesis of the left periphery of phases, the focus and topic marking hypothesis, the multiple question-answer congruence hypothesis, and the focus underspecification hypothesis. They have further succeeded in spelling out important syntactic, prosodic, semantic and pragmatic conditions which operate on the information structure interface. In addition, the papers demonstrate that the current investigations on the topic of information structure have immediate consequences for our understanding of the architecture of grammar: (i) topic and focus exist as grammatical categories in each component of grammar, (ii) their overt syntactic position is in the left periphery of each phase, (iii) if both are marked, the topic precedes the focus, (iv) they are parts of the expressive meaning, (v) their expressive interpretation can depend on their ordinary meaning, and (vi) their pragmatic interpretation can be grammatically underdetermined. Finally, through concrete analyses of topic, focus, and related phenomena in and across different languages, the contributors of this volume have added new and convincing evidence to the research on information structure.