

Introduction

Observe the following sentence pair:

- (1) a. Who did everyone talk to?
 b. Who talked to everyone?

(1a) is ambiguous, allowing either an individual answer as in (2a) or a pair-list answer as in (2b). (1b), however, is unambiguous and allows only an answer such as (2a).

- (2) a. Sam.
 b. Sam talked to Mary, Peter talked to Susan, . . .

This subject–object asymmetry has received much attention (May 1985, Engdahl 1986, Kim and Larson 1989, Chierchia 1991 among others). The fact that context may determine which interpretation to assign to (1a) has, however, been ignored.

If (1a) is uttered in the following context

- (3) Tell me about everyone. Who did everyone talk to?

only the pair-list reading is available. Alternatively, if the quantifier is emphatically stressed only the individual answer is allowed:

- (4) Who did EVERYONE talk to?

I intend to use these phenomena to illustrate how a focus-structure account must be applied to capture the discourse facts, the ambiguity in (1a), and the lack of ambiguity in (1b). The precise details of the argument can be left vague for the moment, but it will involve at least the following two assumptions:

1. Topics have wide scope.
2. The pair-list reading, but not the individual reading, involves a particular dependency type which I call an “I-dependency.” I-dependencies are restricted by the Subject Constraint which constrains I-dependencies to structures in which the subject is interpreted as the sentence topic.

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First, I introduce the basic concepts related to focus structure: Topic and Focus. For the purposes of this introduction a basic diagnostic test for each will suffice. In the following Topic-test (Reinhart 1981), X must be the topic of Speaker B's assertion.

Topic-test: Speaker A: Tell me about X.
 Speaker B: ... X ...

The focus is identified as the stressed constituent.

Let us first examine what happens if *everyone* functions as the topic:

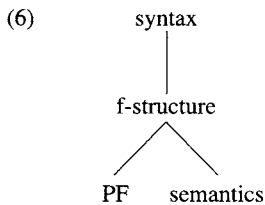
- (5) Speaker A: Tell me about everyone.
 Speaker B:
- a. Sam went to the beach, Peter went to school, ...
 - b. *Everyone went to the beach.

The fact that the response in (b) is not possible shows that *everyone* is not a possible topic. What happens when *everyone* is specified as a topic is that each of the individual members of the set defined by the quantifier become topics, rather than the set as a whole. This is what we find in the "list"-response in (5a). Let us now return to (1a). It follows from what has just been said about the topic properties of *everyone* that if it is interpreted as the topic of the question, the list interpretation necessarily ensues, explaining why the individual reading is blocked in the context (3). If, however, *everyone* is not interpreted as the topic of the question only the individual answer should be possible. One way of blocking the topic-reading of the quantifier is to assign stress to it, as in (4), and make it a focus. (4) is no longer ambiguous and allows only the individual answer (2a). The ambiguity of (1a) therefore follows from the two different focus structures, i.e., two different assignments of topic and focus. When the quantifier is interpreted as the topic of the sentence, the pair-list reading ensues, and when the quantifier is focused only the individual answer reading occurs.

The puzzle presented by the lack of ambiguity in (1b) remains to be solved. In the spirit of what has been said up to now, we can rephrase the puzzle as follows: what prevents *everyone* from being a possible topic in this question? The answer to this question (to be discussed in detail in chapter 6) is the Subject Constraint which constrains dependencies such as the one found between the quantifier and the *wh*-phrase in the list reading to a "canonical" f-structure, one in which the syntactic subject and the topic are identified.

My principal concern in this book is to explore the role of focus structure in Grammar. I examine the interface between focus structure and syntax, the

semantics of focus structure and the intonation associated with it. I define a grammatical level of f-structure (focus structure), an annotated structural description (SD) in which topic and focus constituents are marked. F-structure feeds both PF (Phonological Form), and semantics and is sensitive to lexical information. It feeds PF since this level provides the explicit phonetic spell-out including intonation. I argue that f-structure and not LF (Logical Form) is the input to a semantic rule of Predication. Under this view, the model of grammar takes the following shape:



The f-structural framework provides a natural account of quantifier scope, interpretations of *wh*-in-situ, anaphora, subject–object asymmetries, etc. One major result of my analysis is that *wh*-movement turns out to be constrained by the same constraint which accounts for subject–object asymmetries.

The f-structure-theoretical approach to interpretation is dynamic in that it assumes a theory of discourse which defines the state of the common ground both before and after the utterance of a sentence. I adopt and modify Reinhart's (1981) file metaphor for the organization of the common ground. The common ground is viewed as having the following structure: it consists of a set of file cards which represent existing discourse referents. The common ground propositions form entries on these file cards. Only propositions which are interpretable as properties of a particular discourse referent are entered on the file card for that discourse referent. Common ground information is thus ordered according to the "topics" defined by each discourse referent. The set of file cards is also ordered as follows: a well-defined subset of the cards are located on *top of the file*. The cards in this location are licensed as potential topics of an utterance. Thus, the state of the file before the utterance of the sentence determines the potential f-structures licensed for it. Focusing an NP in the sentence results in positioning either a new card (if the NP is indefinite) or an existing card from the file (if the NP is definite) on top of the file. Focusing thus triggers a new state of the file.

F-structure theory is a pragmatic theory which is concerned with felicity conditions on the relation between sentences and context. Thus Topic can be assigned only to constituents for which file cards are available on top of the

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file, i.e., cards which have been positioned there by the application of the f-structure rules to previous utterances.

F-structure affects truth conditions. Rooth (1985) among others has shown that Focus assignment may determine truth conditions. Chierchia (1992a) shows that Topic is what forms the restrictor on adverbs of quantification. Partee (1992) discusses the idea that the restriction of tripartite discourse representations is akin to Topic and that nuclear scope is the Focus. Following Reinhart (1981), I adopt the Strawsonian view that the topic is the pivot for assessment and show that f-structures involving both main and subordinate assignments of topic and focus are required for interpretation. In particular, I show in chapter 5 that quantifier scope is determined by f-structure. F-structure theory thus forms part and parcel of semantics. It is a property of dynamic semantic theories that the borderline between pragmatics (involving circumstance of use) and semantics is blurred. F-structure theory blurs this line further. I discuss this issue in chapter 1, section 1.4.1 and in chapter 3, section 3.6. The discourse model assumes the following discourse rules:

F-structure rules

- I TOPIC instructs the hearer to locate on the top of his file an existing card (or an existing set of cards) with the relevant heading and index.
- II FOCUS instructs the hearer to either
 - (i) open a new card and put it on the top of the file. Assign it a *heading* and a new index (in the case of an indefinite) or
 - (ii) locate an existing card and put it on the top of the file (in the case of a definite)
- III PREDICATION instructs the hearer to evaluate the predicate with respect to the topic where the predicate is taken to be the complement of the topic.

If the result of the evaluation is TRUE the UPDATE rule applies:

- IV UPDATE instructs the hearer to enter the predicate on the topic card and then to copy all entries to all cards activated by the focus rule.

The following interaction illustrates the application of these rules: A is speaking, B is listening. Since cards for the speakers are available on top of the file, the first person is licensed as the topic of (7):

A says:

- (7) I [have a dog]. [It] is brown.
 FOC TOP

B's update:

1. Select the card for A (first person) from the top of the file. (TOPIC rule)
2. Evaluate "A has a dog" with respect to A. (PREDICATION)
3. If 2 yields TRUE, enter "e has a dog" on A's card. (UPDATE)
4. Open a new card, label it dog_2 . Put it on top of the file. (FOCUS rule (i))
5. Enter " A_1 has e" on this card. (UPDATE)

The following cards are now on top of the hearer's file and are available as future topics:

A_1 e has dog_2	= heading = entry	dog_2 A_1 has e
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Chapter 1 concerns the interpretation of f-structure and defines the basic notions Topic and Focus in terms of the discourse theory associated with f-structure. I show following Strawson (1964) and Reinhart (1981) that sentences are evaluated with respect to their topics: if T is the topic of a sentence S then we check our knowledge of T to verify S. This chapter continues to examine indefinite subjects of intransitive individual-level predicates. I argue that such subjects must be topics. I introduce subordinate f-structures to account for such indefinite topics.

In chapter 2 I show, following Reinhart (1983, 1986), that coreference is determined by f-structure. I then offer an analysis of the interpretation of donkey sentences in terms of f-structure.

Chapter 3 offers an f-structure-theoretical analysis of questions, negation, and contrast as well as *only* and *even*.

Chapter 4 shows how intonation is assigned to f-structure in PF.

Chapter 5 discusses scope phenomena as a type of R-dependency (relevant to the speaker's file). I argue that Topics, by definition, have wide scope. Scope thus follows from f-structure without special stipulation.

Chapter 6 proposes a constraint on I-dependencies. A distinction is made between R-dependencies and I-dependencies (relevant to the hearer's file). I show that all phenomena which are classified as I-dependent (anaphora,

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multiple *wh*-questions, *wh*- and its trace, negative polarity among others) are constrained by the Subject Constraint, a syntactic constraint on *f*-structure.

The conclusion to be drawn from this chapter is that a model of grammar which incorporates *f*-structure in the manner proposed in this book allows for a wide range of linguistic phenomena to be unified under one *single* syntactic constraint.

I restrict the discussion to English and similar languages. Discussion of the relevance of focus structure to syntax in previous work has generally concentrated on languages in which either the focus or the topic has a fixed syntactic position. The former can be exemplified by a focus-preposing language such as Hungarian. (See for example É. Kiss 1991, 1996; Szabolcsi and Zwarts 1993.) An example of the latter is a topic-prominent language such as Chinese. (See for example Huang 1984.) Languages such as Japanese which mark topic and focus morphologically have also been studied with a view to examine the relevance of topic and focus to the syntax. (See Kuno 1976, 1982, 1987.) There are two main reasons why the choice of English makes a stronger argument for my theory than a topic-prominent language, a focus-preposing language or one that marks both:

1. Whereas it is to be expected that topic and focus play a role in the syntax of topic-prominent languages or in focus-preposing languages, this is a much more surprising finding for a language such as English in which syntactic constraints have generally been assumed to be determined entirely by syntactic properties. My proposal is thus more significant because it claims that *f*-structure is responsible for syntactic constraints even in a language such as English, which lacks morphological or (overt) syntactic devices for marking focus or topic (in most cases).

2. My concern is to provide an in-depth study of one language to demonstrate the viability and explanatory power of my account in considerable detail. This approach is standard in contemporary linguistic (particularly syntactic) theory. Since I challenge the most common accounts of phenomena such as binding and extraction, it is imperative to offer an alternative account in terms of *f*-structure precisely for a language such as English for which syntactic accounts have been developed in most detail.

In the concluding chapter I suggest how *f*-structure theory, a fundamental part of Universal Grammar, can be extended to languages which mark topics and/or foci overtly.

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Watt's instructions were to give what Mr Knott left of this dish, on the days that he did not eat it all, to the dog. . . .

But was a dog the same thing as the dog? For in Watt's instructions there was no mention of a dog, but only of the dog, which could only mean that what was required was not any dog, but one particular dog, that is to say, not one dog one day, and the next another, and perhaps the next a third, no, but every day the same, every day the same poor old dog, as long as the dog lived. But a fortiori were several dogs the same thing as the dog?

Samuel Beckett, *Watt* (New York: Grove Press, 1959[1953]), pp. 91, 96

I.1 Focus structure

I use the term focus structure (f-structure) to characterize structural descriptions (SDs) annotated for topic and focus constituents. F-structure feeds both PF (Phonological Form) and Semantics.¹ It feeds PF since this level provides the explicit phonetic spell-out including intonation. (Intonation is discussed in chapter 4.) I argue that f-structure and not LF (Logical Form) is the input to a semantic rule of Predication.

This chapter introduces the discourse theory to which f-structure provides the input. Interpreting f-structure is a dynamic venture, in the sense that the f-structure of a sentence determines its information-change potential. A sentence is thus viewed as a means of changing the information state of the interpreter or hearer. The part of the information state which the hearer has in common with the speaker is the common ground. The f-structure theory of discourse defines the state of the common ground both before and after the utterance of a sentence. The common ground is viewed as having the following structure: it consists of a set of file cards which represent existing discourse referents. The common-ground propositions form entries on these file cards. Only propositions which are interpretable as properties of a particular discourse referent are entered on the file card for that discourse referent. Common-ground information is thus ordered according to the "topics"

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defined by each discourse referent.² The set of file cards is also ordered as follows: a well-defined subset of the cards is located on *top of the file*. The cards on top of the file are licensed as potential topics of an utterance. Thus, the state of the file before the utterance of the sentence determines the potential f-structures licensed for it. Focusing an NP results in positioning on top of the file either a new card (if the NP is indefinite) or an existing card from the file (if the NP is definite). Focusing thus triggers a new state of the file.³

F-structure theory is a pragmatic theory which is concerned with felicity conditions on the relation between sentences and context. Thus Topic can be assigned only to constituents for which file cards are available on top of the file, i.e., cards which have been positioned there by the application of the f-structure rules to previous utterances.

F-structure affects truth conditions. Chierchia (1992a) shows that Topic is what forms the restrictor on adverbs of quantification. Partee (1992) discusses the idea that the restriction of tripartite discourse representations is akin to Topic and that nuclear scope is the Focus. Following Reinhart (1981), I adopt the Strawsonian view that the topic is the pivot for assessment and show that f-structures involving both main and subordinate assignments of topic and focus are required for interpretation. In particular, I define a rule of Predication which allows for a dynamic assignment of truth values. This rule is viewed as a relation between the “topic” of a sentence and its predicate. Formally, Predication is a one-place function that maps topics to propositions, assigning them truth values. It operates on articulated f-structures in which Topic and Focus have been assigned. One of the main innovations provided by the theory of f-structure is therefore the introduction of the pragmatic notions Topic and Focus into the semantics. I provide arguments for the topic-centered rule of predication in section 1.4.1.

In this chapter I commence with a characterization of the terms Topic and Focus (sections 1.1.1–1.1.4). In section 1.2, I propose that truth values are assigned by a topic-centered rule of predication. I then define the level of f-structure and the ground rules for its interpretation: update rules are triggered by the topic and focus constituents in the sentence and define the changes in the discourse file (sections 1.3–5). In section 1.4, following Kratzer (1989a), I show that the subject of predication can be a Davidsonian spatio-temporal argument. This argument, when unactualized, necessarily functions as the topic of the sentence. I call a topic which defines spatial and/or temporal parameters a Stage Topic.

I then examine the individual/stage-level distinction in terms of f-structure in order to probe the nature of topics (section 1.6). I argue that sentences with

stage-level predicates can be assigned an f-structure with a stage topic but that sentences with individual-level predicates cannot. It follows that the subject of intransitive individual-level predicates is necessarily the topic of the sentence. Therefore an NP which can be inserted in this position must be of the kind that qualifies as a topic. An analysis of these NPs thus sheds light on the nature of topics in general. One of the conclusions I draw from this investigation is that subordinate f-structures are required, i.e., f-structure marks both main and subordinate topics and foci.

In section 1.7, I discuss subordinate f-structure in more detail and propose a revised version of the update rules that takes into account subordinate f-structures.

In the last section I compare f-structure-theoretical discourse theory to Information Packaging (Vallduví 1992), Information structure (Lambrecht 1994), and Discourse Representation Theory (DRT) (Heim 1982 and Kamp 1981).

1.1.1 Topic

Both Topic and Focus are often characterized as the salient part of the sentence. This has caused much confusion in the past. For this reason and also because of the vast amount of material written on both notions, I will refrain from offering a proper review of the literature.⁴ Instead, I will introduce the analysis of these notions assumed in this work.

The definition of Topic is derived from Reinhart (1981) who in turn draws on Strawson (1964: 97). According to Strawson the topic has three central properties:

- a. The topic is what a statement is about.
- b. The topic is used to invoke “knowledge in the possession of an audience.”
- c. “The statement is assessed *as* putative information *about its topic*.”

Strawson connects these three properties to explain why truth value gaps come about. He argues that if the topic is what a statement is about and therefore the statement is assessed with respect to the topic, the topic must have reference. If, however, the topic has no reference, the sentence cannot be evaluated as either true or false, since in such a case “a statement which, by hypothesis, is *about* something is really about nothing” (p. 98).

Reinhart adopts this view of topics and offers a formalization in terms of the context set à la Stalnaker (1978): “The *context set* of a given discourse at a given point is the set of propositions which we accept to be true at this

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point” (Reinhart 1981: 78). Each new assertion, if not rejected as false, adds a new proposition to the presuppositions in the context set. Reinhart suggests that the context set has internal organization, in particular, propositions in the context set are classified by their topics. Sentence topics thus determine under which entry a particular proposition is assessed. Take for example:

- (1) A: Tell me about John.
 A': Tell me about Mary.
 B: John invited Mary to dance.

This sentence can be understood to be “about” John or “about” Mary since it can naturally follow the requests made both by speaker A and by speaker A'. According to Reinhart, B's sentence, in the context of A, will be assessed as putative information about *John*. If the new information is not rejected, it is entered under the referential entry for *John*. Similarly, for B in the context of A'. Although the truth value of B's sentence will be the same in both contexts in this case, the way the sentence is evaluated is different.

In view of the fact that a sentence may have more than one potential topic (allowing it to occur naturally in several contexts), it is, in Reinhart's framework, associated with a set of possible pragmatic assertions (PPA) the content of each of which can be introduced into the context set, depending on the topic selected. Reinhart (1981: 80, her (44)) defines the set of PPAs of S ($PPA_{(S)}$) as follows:

- (2) ϕ denotes the proposition expressed by a given sentence S
 $PPA_{(S)} = \phi$ together with [$\langle a, \phi \rangle$: a is the interpretation of an NP expression in S]⁵

The following definition of Topic results:

To say that a sentence S uttered in a context C is about a_i , i.e., that the pair $\langle a_i, \phi \rangle$ of $PPA_{(S)}$ is selected in C, is to say, first, that, if possible, the proposition θ expressed in S will be assessed by the hearer in C with respect to the subset of propositions already listed in the context set under a_i , and, second, that if is not rejected it will be added to the context set under the entry a_i . (p. 81)

The framework I will be developing differs from Reinhart's in two respects. First, I argue in section 1.4 that every sentence must have a topic since if topics are the pivots for assessment it is crucial that every sentence have one. Non-overt topics, I claim, are provided by the spatio-temporal parameters of the utterance. (Reinhart, in fact, speculates in a footnote that this may