

PRAGMATICS AND LINGUISTICS : AN ANALYSIS OF SENTENCE TOPICS*

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Although the subject matter of pragmatic theory is ostensibly linguistic communication, much of it deals, in fact, with the more general problem of human interaction, which is independent of linguistic considerations and of which linguistic communication is just a particular manifestation. Thus, as Grice points out, his principle of cooperation holds equally for rational conversation and for baking a cake. Sentence topics by contrast are a pragmatic phenomenon which is specifically linguistic: Only sentences can have a sentence topic, and what the topic of a given sentence is is determined both by its context of utterance and by its linguistic structure. While the relation of pragmatic aboutness, which as we shall see, defines sentence topics, may also be related to non-linguistic aspects of human interaction, it is severely restricted by the independent linguistic properties of the language whose sentence topics we are considering.

Despite the intensive attention that linguists of various schools have paid to the notion *topic*, there is no accepted definition of it. Before attempting such a definition it will be important to clarify the intuitive sense in which it is used in linguistic theory and to observe some of the reasons why it may be interesting to explicate this notion in the first place. This we do in sections 1–4. In section 5, I return to the question of the definition of topic and argue that it cannot be defined in terms of 'old information'. What needs explication then is the notion *pragmatic aboutness*, which is analyzed in section 6 in terms of the effect of a given pragmatic assertion on the context set and the organization of the information in this set.

1. *Sentence Topic and Discourse Topic*

The topic of a book, a conversation, a sentence, a piece of research, or a movie is taken, in ordinary use, to be what the book or the conversation, etc., are about. So *topic of* expresses the relation of being about. Nevertheless, it is not obvious in advance that *topic of* expresses a unique relation in all these cases. Even the expression *a topic of a given sentence* can express different relations: To the question what sentence (1) is about, or what is its topic, both (2) and (3), among several others, are appropriate answers.

- (1) Mr. Morgan is a careful researcher and a knowledgeable semiotician, but his originality leaves something to be desired.
- (2) (1) is about Mr. Morgan.
- (3) (1) is about Mr. Morgan's scholarly ability.

Intuitively, it is not the same sense of aboutness that is used in (2) and in (3). (1) is about Morgan because it predicates something of Morgan. On the other hand, (1) does not explicitly predicate anything of Morgan's scholarly ability, though it provides some information about it. Roughly, (3) expresses a relation between the proposition expressed in (1) and the class of states of affairs in which Morgan exists and has some scholarly ability. Possibly (1) can be understood as restricting this class. It is only the first of these uses of aboutness that the technical term *sentence-topic* is intended to capture in linguistic theory. For convenience, we will label the aboutness relation expressed in (3) *discourse topic*, following a distinction made in van Dijk (1977), although this is not a commonly accepted terminology. The crucial point for the distinction is that sentence topics must correspond to an expression in the sentence (the topic expression). Discourse topics are topics of larger units and they can be more abstract, though they do not have to be (Morgan can be a discourse topic as well)¹. We will not discuss here discourse topics, but a few words are needed on why it is convenient to distinguish these two types of topics.

That the two notions play somewhat different roles in speakers' discourse strategies can be verified by checking what happens when speaker's expectation regarding them are unfulfilled in a given speech-situation. Let us consider Grice's (1975) famous example of the professor who is asked to write a letter of recommendation for his student, say, Mr. Morgan. In this case, the request sets the discourse topic for the professor's letter — it has to be about Mr.

Morgan's scholarly ability. An answer like (4), unlike (1), is not strictly relevant, since there is no clear sense in which it is about this topic.

(4) Mr. Morgan has a clear hand writing and he is punctual.

Note now, that the same is true for the answers in (5), which are also not about Morgan's scholarly ability.

(5)a. My Aunt Rosa has a clear hand writing and she is punctual.

(5)b. My Aunt Rosa is a careful researcher, but her originality leaves something to be desired.

With respect to the discourse topic, therefore, the answers in both (4) and (5) are equally irrelevant, or are equally in conflict with the addressee's expectation. However, there is a clear difference between these answers. (4) can be interpreted, along the lines outlined by Grice, as implicating that Mr. Morgan is not a brilliant scholar. As such, it will count as an appropriate answer. No such implicature is possible in the case of the answers in (5). Rather these answers will be interpreted at most as rejections, i.e. violations of the principle of cooperation. Or, more likely, we'll just conclude that the professor has been under much pressure recently. What distinguishes (4) and (5) is that although (4) fails to assert anything about Morgan's scholarly ability, it does assert something about Morgan, while the answers in (5) fail even that. In other words (4), but not (5), sticks to the sentence-topic specified by the request. Although this requires further study, it seems, therefore, that a violation of expectations concerning discourse topics can be more easily repaired, or interpreted, than violations of expectations concerning sentence topics, which suggests that these two notions are psychologically distinct.

2. Approaches to the Definition of Sentence Topics

2.1. Preliminaries

The term *sentence-topic* is the Anglo-Saxon equivalent of the term *theme*, coined by the Prague School of functional linguistics, following Mathesius (English translation : 1975). E.g. Firbas (1969), (1975), Sgall, Hajicova and Benesova (1973), Danes (1974), as well as many more recent articles of these scholars. Unlike other relational terms (i.e. terms defined by the relation they bear to the sentence,

like *grammatical subject*) it cannot be defined directly on syntactic structures since different expressions of the same sentence can serve as topics in different contexts of utterance. A common practice for testing this is to imagine possible questions a sentence could answer. For example, if the sentence

(6) Max saw Rosa yesterday.

is uttered as an answer to the question *Who did Max see yesterday ?*, *Max* will be understood to be the topic expression. On the other hand, if it answers the question *Has anybody seen Rosa yesterday ?* *Rosa* and not *Max* will be the topic expression. (The utterances of (6) in these two contexts will differ in intonation.) For the same reason *topic of* is also not a semantic relation. (The proposition expressed by (6) is the same in both contexts.) Rather it is a pragmatic relation, relative to a discourse.

Before we turn to the analyses proposed for topics, I will delimit the discussion in various ways. I will assume, first, that a sentence uttered in a given context has in this context only one sentence topic (though conjoined topics are possible). Next, I assume that there can be sentences with no sentence-topic in a given context. Both assumptions are controversial. For a different opinion on the first, see Reinhart (1976) section 2.2.3, van Dijk (1979), and Fodor (1979). For an alternative to the second, see Gundel (1974, chapter 1) and van Dijk (1979, section 6.4). I will also restrict the discussion to NP topics only. This I do only for simplicity : although other constituents can serve as topics as well, their formal analysis is more complicated. The analysis for NP topics which I propose in section 6 can be extended to other topic expressions, but we shall not discuss these extensions here.

Although the linguistic role of the *r elation topic of* is widely acknowledged, there is no accepted definition for it, and not even full agreement on the intuitions of what counts as topic. In fact, almost every imaginable approach to its definition has been actually proposed. First there have been several attempts to define it directly on linguistic structures, either syntactic or phonetic. It has been defined in terms of linear order — as the first expression of the sentence (e.g. Halliday, 1967), in grammatical terms — as the subject (see references cited in Gundel, 1974), and in intonational terms — as the non-stressed expression (e.g. Chomsky, 1971, and Jackendoff, 1972) — though they define the somewhat broader

notion of presupposition). That the first two of these attempts fail to capture our intuition of what topics are is already obvious from the simple example we considered in (6): In the appropriate context, *Rosa* which is neither the subject nor the first expression can serve as topic. The purely intonational approach, while consistent with the facts, does not define topics directly but rather the way they are marked linguistically. It leaves open the question under what discourse conditions a given expression would count as topic, and, consequently would be unstressed.

Other approaches describe topics in psychological terms of speakers intentions and interests. E.g. topics are described (under a different label) as the expressions representing the center, or focus, of the speaker's attention in Schachter (1973) and Garcia (1975). Although psychological terms seem more fit to describe this pragmatic relation, it turns out that the same psychological notions describe just as successfully the complement of the topic expressions — that part of the sentence which is 'dominant' or provides new information about the topic. Thus, Erteschik-Shir and Lappin (1979) define the dominant (i.e. non-topic) material of the sentence as the material the speaker intends to direct the hearer's attention to. For this reason, notions like the speaker's attention or intentions do not provide sufficient ground for distinguishing the topic and non-topic expressions of the sentence. Yet another approach is to describe topicality as a gradient notion, assuming a hierarchy of topicality, rather than a unique definition. Firbas (e.g. 1975) describes topics as the material lowest in 'the communicative dynamism' where the latter is determined by three parameters: linear order, semantic considerations (e.g. the type of the verb), and the degree of context dependency (e.g. whether the given material is previously mentioned in the discourse). In a different framework, Givon (1976) argues that the topical hierarchy (which determines which NP is more likely to serve as a topic in a given sentence) is determined by four parameters, two of which are the human-non-human scale, and the definite-indefinite scale. Although these proposed parameters are no doubt helpful in the actual identification of the topics in given sentences, they do not explain, in and on themselves, what topics are (and they do not intend to do so).

This leaves us with the two major approaches which deserve more detailed attention. The one, which I have assumed already in section 1, defines the topics as the expression whose referent the sentence is about. The other defines it as the expression represent-

ing old information. In one version or another these definitions (particularly the second) are the most commonly assumed, and both can be found already in the Prague functionalist work (for a survey, see Daneš, 1974).

2.2 Pragmatic Aboutness

The linguists who define the topic to be what the sentence is about, e.g. Kuno (1972) and Dik (1978), take this notion of aboutness as a primitive, without attempting to explain what it means for a sentence to be about (the referent of) one of its expressions. Much more attention to the question of aboutness has been paid in philosophical studies (e.g. Putnam (1958), Goodman (1972)). However, these studeis, which define aboutness semantically, are of little relevance to the problem posed by sentence topics. Their point of departure is that "What a sentence is about is independent of which of its various equivalent formulations is employed" (Putnam (1958) : 125). Consequently, in Goodman's example a sentence like *All crows are black* is about the class of crows the class of black things the class of non black things and the class of things which are not crows (among other things), since this sentence is equivalent to the sentence *All non black things are non crows*, which is about the latter two classes, and since, furthermore, a sentence is taken to be about the designations of *all* its designating expressins. As we saw already, it is a crucial fact about sentence topics, that equivalent sentences may have different topics (even if they mention precisely the same referents). Furthermore, not all referring expressions of a given sentence can be considered sentence-topics simultaneously, and which of the referring expressions of a given sentence counts as topic is determined, in most cases (i.e. except for sentences with a structurally marked topic), by its context of utterance. So, obviously the semantic definition of aboutness does not help us here, and what we are after is an explication of pragmatic aboutness.

An analysis of pragmatic aboutness is outlined in Strawson (1964). Strawson attempts to define the traditional philosophical distinction between subjects and predicates, and his intuitions concerning what subjects are are pretty much the same as the linguists' intuitions concerning topics, and, in fact, he even uses the latter term interchangeably with 'subject'. His analysis is motivated by certain apparent counter examples to the truth - value - gap theory, to which we shall return in section 4.1. Strawson does not provide a definition for pragmatic aboutness, but rather a set of

criteria for the identification of the topic of a given sentence, or what a sentence is pragmatically about. I should mention that his criteria are introduced in a rather parsimonious manner and my presentation of them may not be fully loyal to his original intentions.

The criteria are of two sorts : one has to do with the background and purpose of the utterance and the other with verification. With regard to the first, Strawson assumes two general principles of communication : *The principle of the presumption of knowledge* states that assertions are not "self sufficient units", but rather "Commonly depend for their effect upon knowledge assumed to be already in the audience's possession" (p. 96)². *The principle of relevance* states that discourse does not proceed arbitrarily but rather relates itself to and makes use of what is presumed to be known and "intends, in general, to give or add information about what is a matter of standing or current interest or concern". These two principles affect the identification of the topic in a given utterance : In accordance with the first we will expect the sentence to be related to previous discourse, so we will assume that it is about whatever in the sentence that is already in our presumed knowledge. (This is similar to the claim in linguistics that the topic represents 'old information'.) But Strawson's more important criterion is that an expression will be understood as representing the topic if the assertion is understood as intending to expand our knowledge of this topic, in accordance with the second principle. So the crucial thing here is not what can be assumed to be already known, but what can be assumed about the purpose of the utterance. And Strawson is careful to state only that what is known and what the assertion is about "often and naturally overlap" and not that they always have to overlap. Though certainly relevant, the criterion based on the principle of relevance, like any criterion based on the intent or purpose of an utterance, is somewhat vague. More illuminating is Strawson's second criterion of verification. He argues that "assessments of statements as true or false are commonly, though not only, topic-centered." What this could mean can be best illustrated with Goodman's example mentioned above.³ When the sentence *All crows are black* is understood as an assertion about the set of all crows our natural way to assess it will be to check the members of this set and see if any of them is not black; rather than checking the non-black things we know to see if any of them is a crow. Although these two tactics are equally legitimate, logically, since the information provided by this sentence is classified under crows, it

is our knowledge of crows that we will check in order to assess it.

More generally, the selection of a topic for a given assertion in a given context may be viewed as a selection among the various ways to assess it — it will be verified by checking what we know about the topic. This is not peculiar to quantified sentences: Given e.g. the sentences in (7) (whose topic structure will be discussed in section 3.1),

(7)a. As for Felix, he invited Rosa to dance with him

(7)b. As for Rosa, Felix invited her to dance with him.

Strawson's criterion suggests that to assess the truth of (7a) we are likely to search our knowledge of Felix and see if among the people he may have invited we can find Rosa, while in the assessment of (7b) we are more likely to check if among the things that happened to Rosa we can find an invitation from Felix. Obviously, in this case, either way we take we will get the same truth assessment. But Strawson argues (as we shall see later) that things may be different if one of the expressions in the sentence fails to refer. The point is in any case, that even if pragmatic aboutness is strictly independent of truth-conditions, it may affect the actual verification strategies applied in a given discourse.

In what follows, when I say that a sentence is felt, intuitively, to be about the referent of a given NP, this will mean that it meets Strawson's criteria. In section 6 these criteria will be reformulated.

2.3 'Old Information'

In Strawson's aboutness approach to topics, the status of the information represented by an expression (i.e. whether it may be presumed to be known) is just one of the factors affecting potential topichood. For many linguists, however, the information status is the only factor relevant, and they define what we've been calling here *topic* simply as the old or given information of the sentence. Gundel (1974), Chafe (1976), Clark and Haviland (1977), and Clark and Clark (1977) are just a few examples. The apparent appeal of this approach is that it is simpler and it rests on somewhat better understood notion than pragmatic aboutness. Although I will argue in section 5 that it is wrong both on theoretical and empirical grounds, for the purpose of introducing the troublesome concept of topic to the unfamiliar reader, it is helpful to use the old infor-

mation criterion as well.

The basic difference between the two approaches towards the identification of the topic is that while the first (aboutness) views topichood as a relation between an argument and a proposition relative to a context, the second (old information) views it as a property of the referents denoted by linguistic expressions in a given context. This view is best summarized in Morgan's (1975) words : "It is not sentences that have topics, but speakers ... It is not NP's that are topics but the things they refer to." Chafe (1976) takes this position to its extreme, arguing that all 'information statuses' are, in fact, statuses of the referents, where in his list of 'statuses' he includes, apart from the given and new information statuses, phenomena like contrastiveness, definiteness and even grammatical subject.

The property which is supposed to make the referents topics is their being old information. Obviously, as stated, this does not make much sense, since it is far from clear how referents, or objects, can be information at all. But we could assume that it is the existence of a given individual which counts as possible information, and the question is under what condition this can be assumed to be old information. As pointed out by Prince (1979), discussions of old information assume three distinct criteria for it : *Predictability* (Kuno, 1972), which identifies a piece of information as old if its present mention could be predicted from previous discourse. *Saliency* (Prince's term), or *immediate awareness*, (Chafe, 1976), which identifies a piece of information as old if it can be assumed to be directly in the immediate consciousness of the participants, and *shared knowledge* (Clark and Haviland, 1977), which identifies a piece of information as old if it is generally known to the participants and they can infer it from the given discourse even though they need not necessarily be directly aware of it. Presumably, then, if the existence of the reference of an NP in a given sentence can be assumed to be known by any of these criteria this NP will count as the topic.

Before turning to the evaluation of the two analyses of topics, we will examine further some properties of sentence topics which their analysis should capture.

3. Sentence-level Restrictions on Possible Topics

The identification of the topic expression of a given sentence is an interesting instance of the interaction of syntactic, semantic and pragmatic considerations. Although *topic of* is a pragmatic relation, syntactic and semantic properties of the sentence may restrict the choice of its possible topics. A brief examination of this interaction may also help to further familiarize the reader with what linguists have been calling *topic*.

3.1. Syntactic Considerations

There is a strong preference in discourse to interpret the grammatical subject of the sentence as its topic, or to place the topic in subject position. Although (8) and (9) are logically equivalent, (8) seems more appropriate in a context in which we have been discussing Felix or we intend to assert something about him.

(8) Felix goes out with Rosa.

(9) Rosa goes out with Felix.

(E.g. (8) is a more appropriate answer to the question *How has Felix' social life been lately*, than (9).

Nevertheless, this preference is only a matter of tendency and we can use sentences with non subjects as topics, as in (10).

(10) Kracauer's book is probably the most famous ever written on the subject of the cinema. Of course, many more people are familiar with the book's catchy title than are acquainted with its turgid text. (*The Village Voice*, Oct. 1, 1979 : 49).

By both criteria of topichood we examined *the book* is the topic expression of the second sentence : The sentence is felt to be about the book (or its title), and, the book has been previously discussed so it is the 'old information' in the sentence. In this case, the fact that the subject of this sentence is quantified makes it (as we shall see directly) a less likely candidate for topichood, so the choice of a non-subject as topic is exceptionally easy. In other cases such choice may require heavier stress on the subject, which marks it as non topic. Subjects, then, are the unmarked topics, which means that it is easier to use a sentence when we intend its subject to be a topic. But they are not obligatory topics.

On the other hand, certain syntactic structures have fixed, or structurally marked topic position, which means that NP's in these positions are obligatorily topics. This holds, to a certain extent, to all fronted NP's, but the clearest case is the structure known as Left Dislocation, which is illustrated in (11)⁴.

- (11) a. Felix, it's been ages since I've seen him.
 b. As for Matilda, she can't stand Felix.
 c. Regarding your second proposal, the board has found it unfeasible.

These sentences can be used appropriately in a given context only if the fronted NP can be understood as the topic, i.e. if the sentence is used to assert something about its referent. Compare, for example (12) to (13).

- (12) Felix is an obnoxious guy. Even Matilda can't stand him.
 (13) ?Felix is an obnoxious guy. As for Matilda, even she can't stand him.

The first sentence in these fragments sets an expectation for Felix's being the topic of the next sentence (at least by the old information criterion). There is no problem with using the second sentence of (12) in such context. Felix will be understood as the topic, even though *him* (denoting Felix) is not the subject of this sentence. However, using the semantically equivalent sentence (13) in this context is very odd. This is so because in this case the sentence structurally marks *Matilda* as the topic expression. So the sentence can only be understood as being about Matilda, in conflict with the expectation that it should be about Felix.

Other fronting transformations have similar effect but it depends more on intonation. As pointed out in detail in Gundel (1974), NP's fronted by topicalization, as in (14) or by PP preposing, as in (15), can receive focus (i.e. non-topic or 'new information') intonation, in which case they will not serve as topics. But without this special intonational mark they must be interpreted as topics.

- (14) Your second proposal, the board found unfeasible.
 (15) With Rosa, Felix went to the beach.

(The difference between (14) and (11c) is that in (14) no pronoun is retained.) This intonational option distinguishes the latter struc-

tures from the left-dislocation structures, whose fronted NP's cannot receive focus intonation and must be used only as topics. Passivization is another option available in the language to mark the topic structurally. The subjects of passive sentences are generally used as topics, but as in the case of topicalization, it may change its status with intonation.

3.2. *Tests for topichood*

Having identified structures with marked topic positions, such structures can be used as tests to verify our intuitive hypothesis concerning which NP is the topic expression of a structurally unmarked sentence in a given context : If we can appropriately replace this sentence in the given context with an equivalent structurally marked sentence in which the NP in question occurs in the topic position, this NP can be viewed as the topic of the original sentence. (This has been proposed by Kuno (1972, 1976) and Gundel (1974).) The way it works will be clearer when we employ this and similar tests in the next section. We should note, however, that this test should be used with much caution, since the use of topicalization and left dislocation in discourse is highly restricted. If we apply it to the example (10), the result will be awkward :

- (16) Kracauer's book is probably the most famous ever written on the subject of the cinema. As for this book, many more people are familiar with its catchy title than are acquainted with its text.

Although the book is clearly the topic of the second sentence we cannot use the left dislocated version here. This is so because (as observed in Keenan and Schieffelin, 1976, and Duranti and Ochs, 1979) left dislocation is used to change the current topic of the conversation, and to introduce a new one, while in the given example, the book has already been the topic of the previous sentence. Further restrictions on left dislocated structures, e.g. that they do not allow specific and generic indefinite topics also complicate this test. For these reasons, when this test is applicable, it is clear that the NP in question can be the topic. But when it is not, we cannot, with certainty, infer the opposite.

A more reliable test will be to embed the sentence in question in *about* sentences, as illustrated in (17).

- (17) He said $\left\{ \begin{array}{l} \text{about} \\ \text{of} \end{array} \right\}$ the book that many more people are familiar with its catchy title than are acquainted with its turgid text.

Such structures signal the topic of the embedded clause both syntactically⁵ and semantically. A sentence can be paraphrased this way only if the NP following *about* can be its topic. This test yields the correct result for (10): (17) is both an acceptable sentence (unlike the discourse in (16)) and an appropriate paraphrase for the second sentence in (10).

3.3 Semantic considerations

The choice of a noun-phrase as the topic expression of a given sentence is sensitive both to the semantic properties of the NP itself and to its semantic relations with the sentence. Quantified NPs are often hard, and sometimes impossible, to interpret as topics. The sentences of (18), for example, are unlikely to be understood in any context of utterance as asserting something about a fly or about people. This is verified also by the fact that their paraphrases in (19) are awkward in and of themselves, and are not, in any case, felt to be appropriate paraphrases.

- (18) a. There is *a fly* in my tea.
 b. *More people* are familiar with the books catchy title, then are acquainted with its turgid text.
- (19) a. ?? As for a fly, it's in my tea
 there is one in my tea.
- b. ? He said about people that more of them are familiar with the book's catchy title...

The crucial factor here, however, is not that the NP is quantified but that it cannot be interpreted as referential. Universally quantified NP's can be interpreted (pragmatically) as denoting sets, and consequently sentences containing them can be understood as asserting something about these sets or their members, e.g. :

- (20) Parents don't understand. But *all grownups*, they do it to kids, whether they're your own or not (taped discourse, quoted in Keenan and Schieffelin, 1976)

(The topic status of the quantified NP is signalled by the left dislocation structure.)

Similarly, indefinite NPs, which are traditionally interpreted, semantically, as existentially 'quantified', can be used as specific or generic, in which case they behave pretty much the same as referential expressions denoting an individual or a set. (See Kasher and Gabbay, 1976) Although this may be controversial, I think that (as argued in Firbas, 1966) specific indefinite NPs can, indeed, serve as topics :

- (21) a. Because they wanted to know more about the ocean's current, *students in the science club at Mark Twain Junior High School of Coney Island* gave ten bottles with return address cards inside to crewmen of one of New York City's sludge barges. (*The New York Times*, quoted in Carden, 1978)
- b. When she was five years old, *a child of my acquaintance* announced a theory that she was inhabited by rabbits (*The New York Times*, quoted in Carden, *ibid.*)
- (22) a. It was reported of students in the science club of Coney Island that because they wanted to know more about the ocean current, they gave ten bottles with return address cards to crewmen...
- b. He told us about a child of his acquaintance that when she was five years old, she announced a theory that she was inhabited by rabbits.

By the old-information criterion for topichood the underlined indefinite expressions in (21) cannot be topic expressions, since they obviously represent new information, i.e. the existence of these referents cannot be assumed to be in the hearer's immediate awareness. (Otherwise a definite expression would have been used.) But by the intuitive aboutness criterion, they can be understood as asserting something about the child or the students, though the sentences introduce their topics, rather than picking out some already established topics of previous discourse. This is supported also by the *about* test : the paraphrases in (22) seem appropriate. Several other examples for specific-indefinite topics are cited in Firbas (1966). The same is true for generic indefinites, which can serve as topics even by the old-information criterion, since the set they denote can be, in principle, established in previous discourse as old information⁶. We may conclude, for now, that an NP can be

interpreted as the topic only if it is pragmatically referential, and we will return to the question of old information in section 5.

The choice of an NP as a topic is restricted also by its semantic relations to the sentence. Roughly, it must be possible to interpret the proposition expressed in the sentence as a property of the individual or the set denoted by the NP, or, as we shall put it in section 6, to classify the information provided by the sentence under the referential entry of the NP in question. However, what semantic considerations govern such decisions is very poorly understood, and I can only exemplify them here :

It has been argued by the Prague functionalists (e.g. Firbas, 1975) and Kuno (1972) that the subject of 'presentational' sentences, i.e. a sentence that introduces the entrance of a new referent into the scene cannot serve as topic. This is illustrated in (23) (whose context, from a novel by John Barth is cited in (39)).

(23) At the same moment, the raucous voice of a steam calliope came whistling in off the river.

In such cases the sentence cannot be viewed as assigning any property to the referent of the subject except for its mere existence in the scene.

A different type of relevant considerations is illustrated in (24). In a sentence like (24a), it is difficult to understand Felix as the topic (Unless *Rosa* receives an extra heavy stress). This is tested in (24b), which is not a highly natural paraphrase of (23a). Similarly (24c) seems somewhat unsuccessful, since Felix is not our expected topic. (Judgements on these cases are just a matter of preference. It is possible to imagine contexts in which Felix can be topic, but it is not easy.)

- (24) a. Rosa is standing near Felix.
 b. As for Felix, Rosa is standing near him.
 c. They say of Felix that Rosa is taller than him.

In these cases, the reason why it is hard to interpret the sentences as asserting something about Felix seems to be that the reported states of affairs do not *affect* Felix in any way. (This notion of affect is discussed in Fodor, 1979). But there are many other

semantic factors which constrain the choice of topics, and which can not be reduced to *affect*: In the close-to-minimal pairs below, all observed in Kuno (1976), the (b) sentence is more natural than the (a) sentence, which indicates that the first have chosen a more appropriate topic for the sentence. (Here, again, we are not claiming that the (a) sentences are impossible, but only that they are less natural, i.e. that it is harder to find an appropriate context for them.)

(25) a. ?Speaking of Marilyn Monroe, I lost a book about her.

b. Speaking of Marilyn Monroe, I $\left\{ \begin{array}{l} \text{bought} \\ \text{read} \end{array} \right\}$ a book about her.

(26) a. ?Speaking of Ben, I don't know anyone ahead of him in the line.

b. Speaking of Ben, I don't know anyone ahead of him in the exam scores.

(27) a. ?Speaking of Linda, Max will go see Ben if he can't see her.

b. Speaking of Linda, Max will kill himself if he can't see her.

Although Marilyn Monroe is equally unaffected by someone's buying a book about her and someone's losing a book about her, asserting that the first took place is, for some reason, more easily understood as supplying information about her than asserting the second. What this reason is, as well as what the (a) sentences in (25)–(27) have in common which distinguishes them from the (b) sentences, must await further study⁷.

4. Topics and the interpretation of sentences.

Clarifying what sentence-topics are is not just a matter of intellectual curiosity; several other linguistic phenomena depend on or interact with this pragmatic relation. Many linguists have argued that some apparent syntactic constraints are better explained in terms of topichood relations. Also, there are languages, like Chinese, where topics are argued to interact more closely with syntactic constraints than they do in English. Other languages, like Japanese, mark their topics directly with a special particle (see Kuno, 1972). I will not discuss here this type of interaction, but rather examine some aspects of the role of the *topic of* relation in the interpretation of sentences.

Since the *topic of* relation is pragmatic, rather than semantic, we would expect the aspects of meaning affected by it to be non-truth conditional. However, the two instances of its effect that we will examine — presupposition and anaphora interpretation — are borderline cases, where some may argue (and in the first case, have, in fact, argued) that the identification of the topic does affect the truth conditions of the sentence. Since settling this issue of the precise relations of semantic and pragmatic aspects of meaning is of no direct relevance to the present discussion, I will leave this question open.

4.1 *Presuppositions.*

The relations between topics and existential presuppositions were noted by Strawson (1964). The problem he attempts a solution for is that a sentence like (28), uttered when there is an exhibition in town (i.e. *the exhibition* refers successfully) does not strike one as lacking a truth value, but rather as strictly false, although the second argument expression *the King of France* fails to refer. (28), then, looks like a counter-example to the truth-gap theory.

(28) The exhibition was visited yesterday by the King of France.

This is, intuitively, so because the sentence can be verified by checking, say, the list of people who visited the exhibition. Since we won't find the King of France among them, we know that the sentence is false. The referentially failing expression is "absorbed into the predicate" and the predicate corresponding to *was visited by the King of France* fails to hold of the argument.

Strawson argues, further, that the absorption of a referential expression into the predicate is possible only when this expression is not the topic of the sentence, and it follows from his analysis that only topic noun-phrase expressions carry existential presuppositions. So a referential failure of a non topic expression does not result in a presupposition failure. Given the examples mentioned so far, this assumption may seem unmotivated, since it may be argued that it is the mere occurrence of a successfully referring expression in this sentence which enables us to assess its truth, thus saving it from the truth-gap fate. (This is, in fact, the position taken by Fodor, 1979.) However, Strawson considers also cases like the following where this explanation is not sufficient since the sentence contains no successfully referring expression :

- (29) A : What other examples are there of famous contemporary figures who are bald ?
 B : The King of France is bald.
- (30) A : What outstanding events, if any, have occurred recently in the social or political fields ?
 B : The King of France married again.

(In the context (29) *the King of France* will be heavily stressed). In their context, neither (29B), nor (30B) are assertions about the King of France. (29B) is most likely to be interpreted as asserting something about the set of bald celebrities, namely that it contains also the King of France. (30B) talks about notable events, asserting that they include the event of the King of France getting married again. So (30B) does not have at all a sentence topic, in the narrow sense we introduced here, and to the extent that (29B) can be said to have a sentence topic the topic expression is *is bald* rather than *the King of France*⁸. As for the truth status of these sentences, Strawson argues that "since it is certainly false that the classes in each case include any such item as our answers claims they do, those answers can, without too much squeamishness, be simply marked as wrong answers. So to mark them is not to reject them as answers to questions which do not arise, but to reject them as wrong answers to questions which do arise." (p. 96).

Admittedly, the intuitions supporting Strawson's conclusions are pretty subtle. Nevertheless they seem essentially correct, supporting, thus, the generalization that only sentence-topics carry existential presuppositions. Further cases supporting it are discussed in Gundel (1974).

4.2 Anaphora

The decision as to what is the topic of the sentence in a given context may affect the assignment of reference to pronouns in this sentence. We will exemplify this with the case of conjoined sentences observed on Oehrle (1979). Note, first that, outside of context, the interpretation of the pronouns in the following sentence is restricted.

(31) Felix hit Max and then he hit Bill.

(32) Felix hit Max and then Bill hit him.

In normal intonation, which does not put heavy stress on the pronoun, *he* of (31) is interpreted as coreferential with *Felix* (or alternatively, as a deictic pronoun), but it cannot be interpreted as coreferential with Max. In (32), on the other hand, the pronoun can be coreferential with Max, but not with *Felix*. To get the alternative coreference reading, in both sentences the pronoun must be heavily stressed. This fact is independent of topic relations in the sentences, and the considerations responsible for it need not concern us here. However, Oehrle observed that the interpretation of the pronoun in (31) changes radically if Max is understood to be the topic of the whole conjunction, as exemplified in (33) and (34)

(33) As for Max, Felix hit Max and then he hit Bill.

(34) a. Can you give me an exact description of Max's role in the fight ?

b. Felix hit Max and then he hit Bill.

(35) As for Felix, first Felix hit Max and then Bill hit him.

In such contexts the pronoun of the second conjunct, which is still not heavily stressed, is interpreted as referring to Max, rather than to Felix. A similar shift will occur in the interpretation of (32) if we place it in a context that marks *Felix* as the topic as in (35). In (33) and (34b) the conjunction as a whole is understood to assert something about Max. Oehrle argues that a conjunction can be interpreted as being about a given individual iff each conjunct can be so interpreted. Since the only way to interpret the second conjunct of (33) or (34b) (*he hit Bill*) as being about Max is to interpret the pronoun as referring to Max, this is the option which must be chosen for the sentence to make sense in its context of utterance. This example shows, therefore, that pragmatic considerations concerning what the sentence is about, or what its topic is, may effect radically its interpretation. Other relations between the choice of topics and anaphora-interpretation are discussed in Kuno (1972)⁹.

5. Problems with the definition of topics as old information

Having examined some properties of sentence topics, we can return now to the question of what topics are. Although the two definitions of topics — as 'old information' or as what the sentence is about — are often used interchangeably (i.e. it is assumed that what the sentence is about is necessarily the old-information

referent), we shall see now that they are clearly distinct (i.e. they define different sets) and that topics cannot be defined in terms of old information, both on theoretical and on empirical grounds. In section 6 we will turn to a fuller explication of the definition of pragmatic aboutness.

5.1 Topichood cannot be defined on referents

The first problem for the old-information approach lies in its theoretical assumption that topichood can be defined directly on referents, or that the topic role of an expression can be identified by checking properties of its referents. Despite its apparent intuitive appeal which rests on the fact that we normally use sentences to assert something about individuals and not about expressions¹⁰, this approach leads to a contradiction.

The complement of old information is new information (or *focus*) which is described (e.g. Chafe 1976) as the information assumed not to be in the immediate awareness of the hearer and which the speaker intends to introduce. E.g. When the sentence *Felix praised Max* is uttered in the context of (36), Felix is the topic-expression, since, having been mentioned in the question it corresponds to old information, and Max is the focus expression, corresponding to new information (The question assumes that Felix praised someone and the answer specifies who it was.)

(36) A : Who did Felix praise ?
B : Felix praised MAX.

(37) A : Who did Felix praise ?
B : Felix praised HIMSELF.

Note now that precisely the same assignment of new and old information holds for *Felix praised himself* in the context of (37). Here *Felix* is specified by the question as the topic expression and *himself* is the focus expression. In this particular example, however, the referent of these two expressions is the same : Felix. So it turns out, given the definitions of new and old information, that this person is simultaneously in and not in the participants immediate awareness or general consciousness, which is a plain contradiction.

Perhaps some radical (and non obvious) modifications of the definitions of old and new information could avoid such contra-

ductions, but the point will remain that, since NPs with identical referents can carry different information roles in the same sentence, identifying which NP carries which role cannot be based on what we know about their referents.

5.2 Topics cannot be defined as old information

We should check, next, whether the claim that topics represent old information is empirically valid. This is a harder task, since it rests on our intuitions of what the topic of a given utterance is. Nevertheless, given the intuitive description of topics in the previous sections, we can see that although in most cases the topics tend indeed to represent old information, this is neither a sufficient nor a necessary condition for topichood.

5.2.1 Not much elaboration is needed concerning the point that being old information is not a sufficient condition for topichood. Obviously, in making claims about a given topic, we can mention individuals which were already mentioned in previous discourse or of which the participants may be otherwise immediately aware, although they are not the topic of the present discourse. Here is an example from an actual recorded speech.

(38) A Jewish Grandfather (Shemanoff, transcription reported in Ochs 1979: 63)

(The speaker has been talking about the fact that his grandson is difficult to please. He gives as an example catmeal cereal:) And its uh got good taste. It's good. And the cereal, grandma e don't like cereal but she finished (it) to the last (dish). And I enjoy ... I like it too. It's tasty ! And I uh... (1.2) *He didn't want the cereal. (He) doesn't eat (it).* I said "Todd it wouldn't kill ya, taste it !"

The general discourse topic is the grandson's behavior. But we are concerned here with the sentence-topics in this fragment. The topic of each of the first sentences (which precede the pause marked by the bracketed number of seconds) is the cereal. This is marked also by its left dislocation in the second sentence. But after the pause the speaker returns to his discourse topic and the topic of the following sentences is the grandson. By any criterion for old information, the cereal, which has been mentioned several times is, at this point, vividly in our immediate awareness. Nevertheless although it is still mentioned in the sentences following the pause, it is no longer the

topic. While before it was properties of the cereal that the speaker was concerned with (e.g. how every body likes it) here he is concerned with the properties of the grandson (his rejection of the outstanding cereal). The same point is also illustrated in the example (40) that will be mentioned directly.

This obvious fact, that not only topics may represent old information, indicates at least that our knowledge of what counts as old information is not sufficient to explain how we identify the topic of a given sentence, e.g. how we chose between the two equally 'old' candidates for topichood (the cereal and the grandson) in the example above.

5.2.2 The other assumption of the old information approach, that topics are always old information, or that representing old information is a necessary condition for topichood is more substantial. Analyses of actual discourses (e.g. Keenan and Schieffelin, 1976, Daranti and Ochs, 1979) reveal that topics strongly tend to be old information under at least one of the criteria mentioned in section 2.3. However, this fact may have an independent explanation, i.e. it follows from other requirements for discourse cohesion which are analyzed in Reinhart (1980) and which I will review here only briefly.

The various devices for linking adjacent sentences in a discourse can be reduced to two types of link : the one is referential links between their expressions : Two adjacent sentences are considered referentially linked if any of the following holds: the two sentences contain a mention of the same referent, or there are set-membership relations between their referents, or a referent mentioned in the second sentence belongs to the 'frame of reference' established in the first. The other type of cohesive link is a semantic link between the propositions expressed by the two sentences : two sentences can be appropriately linked by an overt, or easily recoverable semantic connector. Any of these two types of link is sufficient to produce a cohesive discourse, and it is necessary that at least one of them will hold (but some required modifications are discussed in Reinhart, 1980).

The following text from John Barth's novel, *The Floating Opera* illustrates these two types of sentence links. (The two columns appear in this simultaneous form in the original text. The underlining is added.)

(38)

Ready? Well: when I reentered my office the clock in the tower of the Municipal Building was just striking two, and as if by a prearranged signal, at the same moment the raucous voice of a stream calliope came whistling in off the river: 'Adam's Original & Unparalleled Floating Opera', one could guess, has just passed Hambrooks Bar Light...

Ready? Well: you'll recall that chapter before last I declared to Mister Haecker that anyone who wishes to order his life in terms of a rationale must first of all answer for himself Hamlet's question, the question of suicide. I would add further that if he wants my respect, his choice to live must be based on firmer ground than Hamlet's —that "conscience does make cowards of us all."

In the left column there are no referential links between any of the expressions of the sentences and they each report a different event. However, the underlined connectors establish semantic relations between the propositions expressed in these sentences. (I count the colon as a semantic marker of explanation which is in this case causal.)

In the right column, on the other hand, the sentences are not linked by a semantic connector, but several of their expressions are referentially linked, e.g. the mention of Hamlet and a repeated mention of the generic subject of the first sentence.

I argue further, there, that if the option of referential link is chosen, it is not sufficient that just any two expressions would be linked but there is a strong preference to link either the topic or the scene-setting expression of each new sentence to previous expressions. In the second sentence of the left column of (39) both *Hamlet's* (i.e. Hamlet's choice) and *his* anaphoric to the generic. *Anyone who wishes to order his life in terms of a rational*) can count as the topic expressions (both pass the *about* test we mentioned in section 3.2) and both happen to be appropriately referentially linked to the topics of the previous sentence. However, it is not required that the new topic will be linked to the topic of the previous sentence — it may be linked to any expression in the previous sentence.

Of the two types of sentence-links, the referential link is much more common, as evidenced by texts statistically analyzed with

respect to cohesion (e.g. Gutwinsky, 1976). Most of the discourses we produce are tied together only via the reference of their expressions.

Note then, that if discourse conventions require that (unless a semantic connector is present) topics of new sentences should be referentially linked to expressions in previous sentences, it would follow that topics will tend to represent old information. This way of putting it is not just a notational variant of the definition of topics as old information, since the crucial point is that a referential link is not the only linking device. When a new sentence is linked by a semantic connector, its topic (if it has one) is not required to be referentially linked, although, of course, it may be. If topics are defined independently of old information, it would be in these cases that we may find sentence topics which do not represent old information. In the left column of (39), it is not clear, intuitively, that any of the sentences, except perhaps the third, have a sentence-topic at all, so let us consider another example.

(40) ...*The public benches* that used to be west of their restaurant are gone also, it has been rumored that *the removal of the benches* has been brought about by pressure from certain business people who want to discourage those who can't afford to get drunk in public behind iron work railings, from annoying those who can. // Of course, one of the consequences is that *the tenants of 1415 Ocean Front Walk* don't have their benches to sit on...

(Beachhead, Venice, CA, December, 79, 15)

(This is taken from an article in an underground magazine describing the invasion of the entertainment business into the poor beach neighborhood of Venice in Los Angeles.) The first sentences of (40) talk about the public benches and their removal. The last sentence is connected to the previous with the semantic connector of consequence. Although the benches are still mentioned in this sentence, by the intuitive aboutness criterion for topic-hood, the tenants, rather than the benches are its topic. (The text continues also to mention one of these tenants.) This is supported by the fact that we can naturally left-dislocate *the tenants...* in this context as in (41).

(41) One of the consequences is that the tenants of 1415 Ocean Front Walk, they don't have their benches to sit on.

In this sentence, therefore, the old information expression (their benches) is not the topic and the topic is not old information¹¹.

Among their other functions, semantic connectors, thus serve as a device for introducing new topics (whose referents' existence is not old information). A common connector carrying this function in written texts is the counterfactual *if*, as in the second paragraph of (42).

(42) Rick Miranda says earnestly: "It's not just we do good, we feel good... We've learned things... we never learned from our parents."

If Joan Santini were listening to Rick Miranda, her blue eyes would open wide and they'd be saying, "Jeez, we never had anything like that back home." Born and raised in Denver, 39-year-old Joan Santini is possessed of a sparkling ingenue prettiness that is the perfect reflection of her eager conversion to New York... (The Village Voice, Oct. 1, 1979, 31)

(This is taken from an article describing a community project in Chelsea in New York.) The first sentence of the second paragraph introduces a new topic into the discourse — Joan Santini — who is mentioned for the first time. That the hearer could have no previous awareness of Joan Santini's existence is witnessed also by the fact that only the following sentence gives the relevant introductory information about her. By the aboutness criterion this first sentence is nevertheless clearly about Joan Santini.

We should note also that the first sentence of a discourse segment (e.g. a paragraph in a written text) is usually exempt from the requirement of referential link and segmentation is often used simply in order to introduce unlinked sentence topics. (This was also used in (42) above.) In (21) of section 3.3 we noted examples for specific indefinite NPs which serve as topics, though obviously they represent new information. Although I don't have the full context of these examples, they look pretty much like not uncommon first sentences in a newspaper paragraph. In spoken discourse the segmentation signals are, perhaps, not so obvious. However, it was shown in Keenan and Schieffelin's (1976) analysis of taped discourse that left dislocation can serve, in conversation, precisely this function of introducing new topics. In (43) (which is taken with some abbreviation from their sample data) the sentence signals

simultaneously that the speaker is talking about Pat McGee and that he is fully aware that this referent is not in the hearer's immediate awareness.

(43) Pat McGee, I don't know if you know him, he — he lives in Palisades --- he used to go to the school I did...

We may conclude that topics and old information are clearly distinct phenomena. Representing old information is neither a sufficient nor a necessary condition for an expression to serve as the topic expression. Although, obviously, our assumptions concerning what is old information in a given context may affect our choice of topic, topics must be defined independently of this notion^{1 2}.

6. *Topics and pragmatics assertions*

In view of the problems with defining topics as old information we should return to their definition in terms of pragmatic aboutness. An intuitive sense of pragmatic aboutness was already examined in section 2.2. In this section we will consider a somewhat more formal analysis of this notion. The two questions we shall ask here are, first, what does it mean for an utterance to be pragmatically about something, or, more generally, how different assertions of the same propositions are to be described within pragmatic theory. And, next, how can all the specific properties of sentence topics, described in the previous sections, be captured within a pragmatic-aboutness analysis. We will restrict our attention only to the topics of declarative sentences, used as assertions. Although the proposed analysis can be extended to other types of speech-acts we shall not discuss here such extensions.

6.1 *The context set*

The failure to define topics as old information suggests that rather than defining them in terms of the effect of previous discourse on the given sentence we should attempt to define them in terms of their effect on the ongoing discourse. That this may, in general, be a more fruitful direction for the pragmatic analysis of assertions has been proposed in Stalnaker (1978). He defines the *context set* of a given discourse at a given point as the set of the propositions which we accept to be true at this point. (More precisely he defines the context set as the set of worlds compatible with

these propositions, but we shall ignore these details here.) These propositions may be viewed as the speakers presuppositions, and in a nondefective, or 'happy' discourse the speakers are assumed to share the same context set. The effect of each new assertion in a discourse is to add the proposition expressed by it to the presuppositions in the context set. A discourse can be described, then, as a joint-procedure of constructing a context-set. When faced with a new assertion the hearer assesses the proposition expressed in it with respect to propositions already in his context set. If he finds no reason to reject, or challenge it, it is added to this set. The hearer need not have a substantial basis for believing the content of the new assertion. If he has not rejected it, the proposition expressed in this assertion will be assumed to be included in the context set for the following discourse.

As it stands, however, this analysis does not take us very far in handling the problem of topics or pragmatic aboutness, since the proposition expressed by the sentence is the same regardless of which of its NP:s reference is intended as topic, so the effect of asserting e.g. the sentence *Felix adores Rosa* on the context set will be identical if *Rosa* or *Felix* are used as topics: In both cases it adds that *Felix adores Rosa* to the set of contextual presuppositions. So the problem we encounter here is that of describing the different effect on the context of asserting the same proposition about different things. I argue that the answer lies in the internal organization of the context-set. We shall see, first, the intuitive line of this answer, and then procede with a more formal analysis.

Since the context set is a possibly large body of information constructed during the discourse, it is unrealistic to assume that this information is stored just as lists of unrelated propositions. A more realistic assumption is that during the construction of the context set the speakers attempt some organization and classification of the information, which would make it easier to remember and more accessible for the evaluation of coming information.

A useful metaphor for the procedure involved here is the organization of a library catalogue (where each book-entry corresponds, in our metaphor, to a proposition). One system of organization is the alphabetical list of all the books in the library, which can be compared to a list of all propositions admitted to the context set, ordered chronologically (i.e. following the order in which they were introduced.). This catalogue, however, is of very little use when

the reader is interested in finding out what is known (or has been written) on a given subject. For this topic-oriented search he turns to the subject catalogue. Intuitively, the construction of the context set resembles more that of the subject catalogue. The propositions admitted into the context set are classified into subsets of propositions, which are stored under defining entries. At least some such entries are determined by NP-interpretations. NP sentence-topics, then, will be referential entries under which we classify propositions in the context set and the propositions under such entries in the context set represent what we know about them in this set¹³. Local entries corresponding to sentence-topics can be further organized under more global entries, thus constructing the discourse topics. This means that the two procedures in the construction of the context set — *assess* and *store* are, in fact relativized to topics (assess by what you already know about the topic, store under an entry corresponding to this topic), a point to which we shall return directly.

Sentence-topics, within this view, are one of the means available in the language to organize, or classify the information exchanged in linguistic communication — they are signals for how to construct the context set, or under which entries to classify the new proposition.

With this rough intuitive picture of what sentence-topics are for, we can turn to their analysis.

6.2 Possible Pragmatic Assertions (PPA)

First, some mechanism is needed in the analysis of the pragmatic component of assertions to distinguish between different assertions, of the same proposition (about different things). We will assume that each declarative sentence is associated with a set of possible pragmatic assertions (PPA), which means that that sentence can be used to introduce the content of any of these assertions into the context set. In a given utterance of the sentence a pragmatic assertion is selected from this set, subject to considerations of the context of utterance. (We will return to the selection function in section 6.4.) Letting ϕ denote the proposition expressed by a given sentence, S, the set of PPA's of S ($PPA(S)$) is defined as follows :

$$(44) PPA(S) = \phi \text{ together with } [\langle a, \phi \rangle : a \text{ is the interpretation}$$

of an NP expression in S] . (Subject to the restrictions in section 6.3).

The members of $PPA_{(S)}$ are thus, the proposition expressed by S and each possible pair one of whose members is this proposition and the other is an interpretation of an NP in S. If the first member (\emptyset alone) is selected in a given context, this means that the sentence is used with no sentence-topic. If any other member is selected, the NP expression corresponding to a is the topic expression of S, in the given context, or S is pragmatically about a in that context¹⁴. In principle, then, (44) allows any sentence to have either no topic or to have as a topic the interpretation of any NP occurring in it. But some required modifications will be mentioned directly. So we define the topic expression of a sentence S in a context C to be the expression corresponding to a_i in the pair $\langle a_i, \emptyset \rangle$ of $PPA_{(S)}$ which is selected in C. But what needs to be explained is what it means to chose a given pair $\langle a_i, \emptyset \rangle$ from the PPA set of a given S in a given context, or how is the effect of such choice on the context set to be described :

To say that a sentence S uttered in a context C is about a_i , i.e. that the pair $\langle a_i, \emptyset \rangle$ of $PPA_{(S)}$ is selected in C, is to say, first, that, if possible, the proposition \emptyset 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 ¹⁵, and, second, that if \emptyset is not rejected it will be added to the context set under the entry a_i .

The first process corresponds to Strawson's criterion of verification which we discussed in section 2.2 : Intuitively, if S is about a_i in C it is our knowledge of a_i that we will check in C, in order to assess S. Thus, if a sentence like *all crows are black* is used with *all crows* as the topic expression (which would be its most unmarked use), the proposition expressed in it will be assessed by checking what we know about crows, rather than about non-black entities. However, as we observed in the previous section, it is possible, in principle, that a given sentence will be, in C, about a referent that can not be assumed to be already in the context set of C. This is particularly clear in the case of specific-indefinite topics, where the referent is explicitly assumed to be unknown to the hearer. So, obviously in these cases the propositions cannot be assessed with respect to a subset of propositions already listed under an entry corresponding to this referent (since no such entry exists). Nevertheless it can still be about this referent in the second sense of being

listed in the context set (if the assertion is not rejected) under its entry. In such cases the assertion of S opens a new NP-interpretation entry in the context set, whose member, the proposition expressed in S, is now available for assessment of future assertions about this entry. This second sense of aboutness corresponds roughly, perhaps, to Strawson's second criterion based on the 'principle of relevance', which identifies a , as what S is about if an utterance of S can be viewed as intending to expand our knowledge of a_1 .

We assume, further, that (mythological and fictional entities aside) only individuals (or sets of individuals) whose existence has been established may serve as entries in the context set. If this is so, 'truth-gap' cases are those cases where the pragmatic assertion requires listing the proposition under an a which does not meet this requirement i.e. which fails to refer, and consequently, we can neither find an entry for it nor open a new entry for it in the context set. This captures the hypothesis of section 4.1, that only topics require the existence of their referents as a precondition for the sentence to have a truth value.

We may note, finally, that this view of pragmatic assertions as pairs of an NP-interpretation and a proposition is not just a terminological device. In fact, the different pairs in the PPA set of a given S may be affected differently by certain sentence operators, which is what we would expect if these operators predicate of the pragmatic assertion of S and not merely of the proposition expressed in S. The relevant operators here are, e.g. *surprisingly*, *it's strange that*, *it's annoying that*, *as could be expected*, etc. But the more 'pragmatic' the operator is (i.e. the more semantically empty or context dependent it is), the more striking is the difference in its application to the different PPA's of S. We may illustrate this with the operator *it's no wonder that*. The sentence (45a) is assigned by (44) four possible pragmatic assertions: One is the bare proposition expressed in it, the other is the pair consisting of this proposition and the interpretation for *Carter*, i.e. the assertion in which Carter is the topic, the third is the assertion with the American Athletes as topic, and the fourth is the assertion with the Olympic games as topic.

- (45) a. Carter is considering withdrawing the American athletes from the Olympic games.
 b. It's no wonder that Carter is considering withdrawing the American athletes from the Olympic games.

Embedded under the operator *it's no wonder that* as in (45b) the sentence can be used to mean different things depending on which of these PPA's is selected in its context of utterance. These different meanings can be readily observed if, to disambiguate the sentence (pragmatically), we consider paraphrases with a marked topic position, as in the left dislocation sentences in (46). (45b) can be used to mean any of these paraphrases.

- (46) a. As for the Olympic games, it's no wonder that Carter is considering withdrawing the American athletes from them (because they are such a farce).
 b. As for the American athletes, it's no wonder that Carter is considering withdrawing them from the Olympic games (because they are so bad that they may lose).
 c. As for Carter, it's no wonder that he's considering withdrawing the American athletes from the Olympic games (because he is such a hard liner).

That the sentences in (46) suggest different things can be illustrated with the different possible explanations for their utterance in the parentheses of each example. Obviously there are many other imaginable explanations for each of these sentences. The point is, however, that such explanations elaborate on some property of the topic. What is considered to be no wonder in each case is that the given proposition holds of the given topic. If the fourth pragmatic assertion of (45a) — the bare proposition — is selected, i.e. if (45b) is uttered with no sentence topic, the explanation is more likely to consider the political background that led to the event mentioned in the proposition (though this use may be harder to distinguish from (46c) outside of context, since, as we saw in section 3.1, the subject expression *Carter* is the unmarked topic expression and (45b) will tend to be understood, in isolation, as being about this topic). Operators like *it is no wonder that* may be viewed, thus, as comments on the fact that a certain proposition is included in the context set. In the topicless cases, it is its mere inclusion that is commented on. In the other cases, the comment is on the fact that this proposition is listed under the relevant topic-entry, in which case the operator takes a pair $\langle a_i, \emptyset \rangle$, rather than the proposition o as its argument.

6.3 Restrictions on the PPA set

The definition (44) allows each sentence, in principle, to be

used with any (or none) of its NP's as topic. However, we saw in section 3 that this is not true of all sentences. The syntactic form and the semantic interpretation of a given sentence may restrict the choice of its possible topics determining that the sentence has only one, fixed, possible topic, or that it has no NP-topic, regardless of its context of utterance. Since these considerations are independent of context they will be best described as restrictions on the set of PPA's of S, rather than as restrictions on the selection function which selects a given PPA from this set in a given context. The definition (44) must, therefore, be modified to capture such restrictions. However, since, as we saw in section 3.2, at least some of these restrictions are not yet sufficiently understood, I will not attempt here a formalization of the required modifications, but rather exemplify some of their effects.

If the sentence has the left-dislocation syntactic form, its set of PPAs has only one member, $\langle a_i, \emptyset \rangle$, where a_i is the interpretation of the left dislocated NP, which means that this sentence can be successfully used only when the selection function allows the selection of this pragmatic assertion in the given context. The same is essentially true for topicalization and PP preposing structures, but as we saw in section 3.1, intonation should be considered here. Existentially quantified sentence (where no specific or generic interpretation is available) have in their PPA set the bare proposition \emptyset , and any possible pair $\langle a, \emptyset \rangle$ except the one in which a corresponds to the quantified NP. So, sentences like *there is a doctor among Rosa's friends* or *Rosa's friends should call a doctor* may be used with *Rosa* or *Rosa's friends* as topic (or with no topic) but not with *a doctor* as topic. Intuitively this is so because only individuals or sets of individuals may serve as entries under which information in the context set is classified and stored.

The PPA set of conjoined sentences is also severely restricted. $\langle a, \emptyset \rangle$ is a possible pragmatic assertion of a conjoined S only if a is an interpretation of an NP occurring in both conjuncts. This captures the intuition that for a conjunction to be about a certain topic, both conjuncts must be about this topic¹⁶.

- (47) a. Max hit Ben and Felix hit Fritz.
 b. Max hit Rosa and she hit Fritz.
 c. Max hit Ben and then he hit Fritz.

Thus, the PPA set of (47a) contains only the bare proposition

expressed in it, since no NP in this sentence occurs in both conjuncts. That this sentence can have no sentence topic can be checked with the left dislocation test: Sentences like *As for Ben Max hit him and Felix hit Fritz* are odd. (Unless the second sentence is read independently, as a new assertion.) (47b), on the other hand has in its PPA set also $\langle a_i, \emptyset \rangle$ where a_i is an interpretation for *Rosa*, since the pronoun in the second conjunct may have this interpretation. (47c) has three PPAs: the bare proposition, the interpretation of Max as a , and the interpretation of Ben as a , since the pronoun in the second conjunct can be interpreted as any of these NP's. This restriction on the PPA_(S) of conjoined sentences accounts for the anaphora facts that we discussed in section 4.2: If, e.g. Ben is selected as a topic of (47c) in a given context, the pronoun can be understood only as referring to Ben. In our terms — the only PPA for this sentence with *Ben* corresponding to a is the one where a is mentioned also in the second conjunct.

6.4 Conditions on the selection function

The selection function maps each pair $\langle C, S \rangle$, where S is a sentence and C is its context of utterance, onto a member of the PPA_(S), i.e. it selects one of the members of the PPA set of S in the context C. Obviously, we cannot at this stage give a precise formal definition of this function, and a more realistic goal is that of defining some of the conditions that this function should meet. We will consider here, briefly, only those conditions which we have already observed, intuitively, in the previous sections. We will also ignore here the effect of intonation on the identification of topics. While, obviously, this is an important criterion in the perception of spoken discourse, we are interested here in the more general conditions underlying an intonational choice — those conditions which guide the producer of an oral discourse in choosing an intonation, or the reader of a written discourse in choosing a topic. For convenience, I will introduce the conditions here as instructions for the selection procedure, as in (48).

- (48) I. Select $\langle a_i, \emptyset \rangle$ if a_i is already in your context set, unless:
- 1) \emptyset is linked by a semantic connector to the previous proposition in C, or
 - 2) the utterance of S starts a new segment in C, in which cases you are free to select any of the members of PPA_(S).
- II. When permitted by I, select $\langle a_i, \emptyset \rangle$ if a_i is the interpretation of the subject expression of S. (But see footnote 18)

(48 I) Captures the strong preference observed in discourse to identify the topic as the expression in the sentence which represents 'old information'. The unless condition of (I) is a first approximation of the contexts we exemplified in section 5.2 in which the topic need not be 'old information' or referentially linked to elements in previous discourse. A further specification of this condition will require a distinction between that information in the context set which is 'general knowledge' and the 'immediate' information — that accumulated during the participants' work on the given segment of the discourse (where the definition of *segment* awaits much study). The intuitive picture underlying the condition (48 I) is that within each segment of a given (happy) discourse the speaker attempts to relate the proposition of each new assertion to the immediate information in the context set, either by expansion and further classification of existing entries (subsets of propositions) or by establishing semantic relations between existing entries and new entries opened with the inclusion of the new proposition. The choice of topics already in the context set facilitates the first strategy, and the use of a semantic connector facilitates the second. We may open a new referential entry to list the new proposition under if there is an established semantic relation between this proposition and a preposition in another entry, which would count, then, as a relation between the two entries.

(48 I) allows several choices of a $\langle a, \phi \rangle$ for a given S if its unless condition is met, or if more than one a in the PPA set of S is already in the context set (i.e. if more than one NP represents 'old information:'). In this case, the second condition of (48) captures the fact discussed in section 3.1 that subjects are the unmarked sentence-topics, i.e. that there is a strong preference to choose, when possible, the pragmatic assertion in which a corresponds to the subject. So I and II together determine that (unless the unless condition of I is met) if the subject is 'new information' and a non subject is 'old information' the non subject will be selected as topic. In the other cases, if the sentence has in its PPA set a PPA with a corresponding to the subject, this PPA will be selected, i.e. the subject will be the topic expression¹⁷. Although other factors which we shall not discuss may interfere in favor of the selection of a non-subject as a topic even when (48 I) allows the selection of the subject, condition II captures the option which is generally preferred¹⁸.

The second condition of (48) is of different nature than the

first. Rather than reflecting discourse strategies, it reflects properties of the syntactic and semantic processing of sentences. Subjects are known to have 'prominence' with respect to several syntactic phenomena, and they also correspond generally to the argument position in the logical form of sentences of natural language¹⁹. For the latter reason it is easier to interpret the sentence as being about its subject, then, say, about its object, since in the logical form, something is predicated directly of the subject's interpretation.

With this, then, we have covered all the properties of NP sentence-topics which were discussed in the previous sections. The conditions in (48), together with the restrictions on the PPA set in section 6.3, capture the major criteria for the actual identification of sentence topics in discourse which are assumed in the linguistic literature. Nevertheless, these are, obviously, not the only conditions, and applied to actual discourse, they will not always identify the topic correctly. It is within the area of specifying the conditions on the selection function that much empirical work is still needed.

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NOTES

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¹Van Dijk defines the discourse topic as a proposition entailed by the joint set of sentences in the given discourse. Two other recent studies attempt a definition of this notion, without distinguishing it from sentence-topic: Keenan and Schieffelin (1976a) define *discourse topic* as "the proposition (or set of propositions) about which the speaker is either providing or requesting new information" (p. 338). Dascal (1979) defines it (following Schutz) roughly as the problem shared by the discourse participants. Note, however, that a discourse topic need not always be a proposition (or a problem). A discourse elaborating on various characteristic properties of Morgan (his relations with his wife, his scholarly ability and his eating habits) may be plainly about Morgan. This point is elaborated from a different perspective in Bayer (1980a, 1980b).

²The quoted pages are from Steinberg and Jakobovits (1972). All following quotes are from the same page.

³The relevance of this example was brought to my attention by M. Dascal, private communication.

⁴In fact, the sentences in (11) are base generated, so no 'fronting' is involved. But this has no bearing on the present discussion.

⁵As pointed out in Akmajian (1979) such structures share syntactic properties with left-dislocation structures.

⁶For reasons I don't fully understand, though, singular generic indefinite NP's does not 'pass' the *about*-context test: Compare (I) to (II) :

I. She said about sharks that they won't attack unless they are very hungry.

II. She said about a shark that he won't attack unless he is very hungry.

III. A shark won't attack unless he is very hungry.

While (I), with a plural generic as a topic is unproblematic, the generic reading of (III) is not preserved in (II). The *about* context seems to force the specific reading.

⁷Bayer (1980b) argues that the relevant considerations here are not at all semantic, but they reflect certain kind of contextual expectations : considering (26), for example, we attach, normally more importance to someone being best in the exam-scores than his being first in the line. Therefore (26b) is felt more as providing some relevant information about Ben. However, if these values are reversed in an appropriate context (26a) will be just as acceptable.

⁸It would be recalled that I excluded non NP topics only from the scope of this paper. Whether predicate expressions can serve as sentence topics and if so what does it mean, awaits further study.

⁹But Carden (1978) cites many actual-discourse counterexamples (two of which are mentioned in (21)) to Kuno's hypothesis. This suggests that to the extent that these hypotheses are correct they should be modified to hold for topics in the aboutness sense rather than to predictable (or old) information.

¹⁰This apparent intuitive appeal holds only for the claim that topics are referents. I fail to see even an apparent intuitive appeal in Chafe's (1976) claim that "information-statuses" like definiteness or grammatical-subject are properties or referents.

¹¹Of course, one may argue that the tenants are old information

because they are related to or 'inferrable' from the general discourse topic of life in Venice. A definition of old information that would allow that would be, however, too broad to be of any use at all, since it is hard to imagine what information in a given context, would not meet this requirement.

¹²We should note that this conclusion is consistent with the Prague-School functional analysis, e.g. Firbas (1969), where old information has always been considered as only one of the factors effecting topichood. Firbas (1966) cites several interesting cases for narrative texts with new-information topics (or 'themes').

¹³That the context set should contain also sets of NP interpretations (or referents) and not only sets of propositions is suggested in McCawley (1979) as part of a proposed solution to certain semantic problems. It is crucial for his analysis, however, that any referent mentioned in the discourse will be listed in the referents set, while here we assume only that interpretations of NP-topics serve as entries under which propositions are listed in the context set.

¹⁴(44) allows only NP interpretations to be the a of $\langle a, \emptyset \rangle$. This is so because we restricted the discussion in this paper to NP topics only. As mentioned in section 2.1, it is possible that other expressions can serve as topics, and hence as a relevant a . It is also plausible that scene-setting expressions that specify the temporal or spatial background for the sentence also function as an a of a pragmatic assertion. So, in fact, the set $PPA(S)$ may be larger than that defined in (44).

¹⁵We should note that this is only a matter of the preferred strategy. Obviously a pragmatic assertion $\langle a_i, \emptyset \rangle$ may be rejected, also by checking other subsets of the context set then those listed under a_i . We assume only that whenever possible, the preferred strategy will be the one described here.

¹⁶This is true only for genuine coordinate conjunctions. As is well known, sentences with the coordinate syntactic form may be used with one of the conjuncts semantically subordinate to the other, in which case the restriction under consideration does not apply.

¹⁷It would be recalled that the selection function can map S only onto one of the members of its (independently determined) PPA set. In left dislocation sentences, for example, this set does not include the PPA where a corresponds to the subject, since these sentences have only one PPA , where a corresponds to the left dislocated expression. So, obviously, condition II says nothing about such sentences.

¹⁸More generally, (48 II) should be stated to require that if more than one $\langle a_i, \emptyset \rangle$ is permitted by (48 I), e.g. if more than one a is already in the context set (or is 'old information') the pair selected should be the one in which the a corresponds to the NP highest in the accessibility hierarchy of Keenan and Comrie (1977) which is stated in (i).

(i) Subject > direct object > indirect object > object of proposition. This means e.g. that if both the direct and the indirect objects are permitted by (48 I) to be selected as topics, the preferred topic will be the direct object. This is consistent with the functional hierarchy observed in Givon (1976). However, since I haven't examined such cases in this paper, I will not elaborate on this here.

¹⁹For the first claim, see, e.g. Keenan and Comrie (1977). For the second, see Keenan and Faltz (1979), Reinhart (1976, 1978).

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